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The uproar over genetic engineering

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New Faithful.

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New Faithful. The 1977 VW Rabbit.

Rabbit

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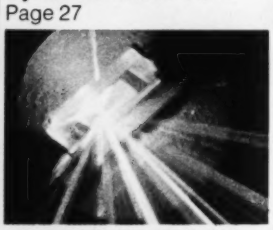

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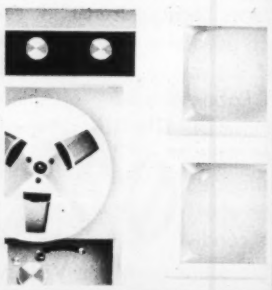

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Party Lines

The Republican phoenix/By Robert Shrum

Mournfully, the remaining rump of Republican governors recently convened in Washington "in a spacious conference room—too spacious, we could all fit in the average hotel room—right after Thanksgiving. So what the hell do we have to give thanks for?" one participant groused. But politicians are inherently optimistic. Predictably, the governors and the Republicans who met and mingled with them searched for a means of resuscitation. From the Republican left, which is not very far, to all but the far right, there seemed to be a consensus that "there aren't enough purists to go around," as Iowa's moderate governor Robert Ray put it. In a speech to the governors, vice-president not-to-be Robert Dole publicly seconded that diagnosis: "We have faltered by projecting a very dogmatic image."

Seeing that problem is only the first step to a solution. Ronald Reagan, forgetting Gertrude Stein's wisdom about roses, recently suggested that the name of the party be changed. But Dole, who has a side brighter than his image in the vice-presidential debate, insists that the change must be substantive, not cosmetic: that Republicans must "not just [be] opposing and criticizing Carter... but offering realistic alternatives." In an interview in his Senate office, he recalled the House members who during the Johnson administration forwarded "Constructive Republican Alternative Proposals." He prefers the idea to the title, noting that Republicans "seem to keep stumbling over acronyms—CRAP or CREEP."

"We have to offer programs like National Health Insurance," Dole says. "When 70 percent in the polls are for it, it's folly to fight down to the last man. We're almost there already." He also urges a reach for lost constituencies, "a Republican version of affirmative action"—a damning phrase in the days when Nixon was flailing against quotas. "I didn't go to a single black event during the campaign," Dole says. "I kept wondering, but I assumed that wasn't my role, that someone else was doing it. I listened to Jesse Helms [the ultra-right senator from North Carolina] and others to the right of Reagan saying that we don't need the black vote. But we can't win if we let the Democrats run off with 94 percent of any group. We need candidates who are black and women and who win."

Reagan manager John Sears, perhaps the sharpest political mind in his party, regards a lot of this as whistling in the darkness of defeat. By his reckoning, "Republicans won't be able to pull black votes for ten years even if we start now." As for constructive alternatives: "We have to go where Carter isn't. You've got to take what they give you if you're out of power." Shaking his head in quick dismissal of one Dole notion, Sears asks rhetorically why people should favor a faint Republican shadow of health insurance.

Confused about what to do, Republican leaders naturally tend to focus on who will do it. The choice of a new national chairman in January now commands their attention and columns of press speculation. The media are treating it as a skirmish for the Republican soul between the Reagan forces, the nonideological technicians and John Connally, who could use the job as a steppingstone. But in fact the outcome promises to be as ambiguous as the party's non-stance on issues. Dole concludes that the choice "will be someone everyone can accept. I don't think there'll be much bloodletting; there's not much blood to let." Reagan aide Lyn Nofzinger has told a Republican senator: "We don't have a candidate. We're not trying to control the chairmanship."

It's not that the Reagan forces are surrendering. It's that they regard such issues as largely beside the point of true power in the party. The Republicans who have controlled the Congress in only four of the last forty-six years, are a presidential party, with no prospect of legislative dominance. Their best hope is to take over the White House when a Truman can't end a Korean war or a Johnson blunders into Vietnam or a Carter.... The Republican future is three and a half years away, in whatever sports arena becomes the next convention hall. There and then the struggle for the Republican identity will be won and lost. The identity of the national chairman, like the content of any and all constructive alternative proposals before then, will be a minor point. In 1968 in the Republican party and in 1972 and 1976 in the Democratic party, the eventual nominee was no favorite of the national chairmen, all of whom soon after lost their posts.

Seen in this context, the future of the Republican party may become its past in the person of Ronald Reagan. John Sears doesn't volunteer it, but talking with him, the logic of another Reagan candidacy emerges piece by piece. Sears numbers as likely contenders Howard Baker, John Connally and the newly elected governor of Illinois, James Thompson, a liberal who voted against the posthumous endorsement of the 1976 Republican platform during the post-Thanksgiving governors' meeting. "The right wing," Sears adds, "has no candidate unless Reagan is resurrected." Isn't Connally sufficiently conservative? "You can't pin John down very much week to week."

Reagan, Sears observes, has the only personal base of power in the party. "Rockefeller's not going to be around anymore and Ford will have very little influence. He won't be that useful at raising money and certainly he can't run again." Reagan has a financial base—a million-dollar surplus

SHELLY KATZ/BLACK STAR

from his 1976 campaign. He can donate a thousand dollars each to favored congressional candidates in 1978 and any amount in state races. Or, as Sears allows, "he could use it to run again."

But what about the moderates, the possibility of a Thompson? The Ripon Society, that long-suffering squad of young progressive Republicans, is proclaiming that their type can "take over the GOP." Sears responds that a Thompson might win "if he had political acumen, if he made no mistakes like needlessly antagonizing the conservatives. Two years from now, they will still remember his refusal to endorse the platform last week. The moderates seem to forget that you can never get elected until you're nominated." And in the crunch of the convention, Sears says, remembering his experience as Nixon's delegate chief in 1968, "there is no middle of the road. To get Nixon over the top, we had to scare both extremes [the conservatives and the Rockefeller forces] that the other side would win." Nor is the Republican primary electorate exactly a model of moderation. "The right wing may be a minority of the country, but it's a majority of our 20 percent minority," mourns a northeastern Republican senator.

Would Sears rule Reagan out because of his age (he will be 69 in 1980)? "No, everybody knows he will be old, but I've never really thought age was a problem. The question is: is the guy still capable? Reagan is in a position where he can make a decision about it in a couple of years." After all, he does look 55, and he could give a speech, if he has to, about old men such as Churchill, Adenauer and de Gaulle. But isn't there a conservative converse of the moderate problem—that it isn't worth being nominated if you can't get elected? Sears replies: "It is easier to conceive of a Reagan than a Helms. Voters ask what kind of guy is this. California is not a conservative state. Reagan's success there was that he could poll blue-collar voters—exactly what the party needs. And they don't sit around discussing political philosophies."

By Sears' calculation, the Goldwater debacle is not an accurate prologue to Reagan, "who was a moderate governor." He could be a conservative who does seem to care about people. On foreign policy, where Goldwater frightened the nation into a democratic landslide, Sears says that Reagan would be reasonable. "If he had become president, détente would have continued. It's a matter of degree. It's good to have the Russians think you're a little incorrigible—as long as you're not."

Sears finally exchanges his initial "can" for the more definite "will": "Reagan *will* look at it in two years." That brief span of time can be a political eternity. In 1973, Hubert Humphrey perceived Jimmy Carter as just another one-term Georgia governor. But the famous Reagan of 1977 possesses an advantage similar to that of the once obscure Carter. Just as Carter the southerner could hold his base while expanding it to include liberals, the conservatives might forgive Reagan, more than any other candidate, a measure of moderation for the sake of a general election. Reagan does have an undelivered acceptance address—and he has been recycling his best lines for years. The prospect makes the depleted ranks of Republican progressives shudder. But their party, like Reagan, has a tradition of recycling. So it shouldn't be too surprising if the Republican future looks to the past, if the party goes home to its heartland and to Reagan. ●

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Letters

Cornering the Corps

Thank you for your fine articles on the Army Corps of Engineers ("The Army Corps marches on" and "A close-up on the Corps: the bulldozing of New Burlington," November 12). Because we and 600 other people of Days Creek, Oregon, are currently threatened with a huge Corps dam, the pieces by Michael Parfit and John Baskin had special meaning to us. The light they shed on odious Corps dam building is one of the best hopes we prospective victims have.

Our homes, like those of New Burlington, would be completely destroyed. We have made strong, but futile, pleas to our chief congressional foe, the otherwise respected Senator Hatfield. We feel that we are being sold down the river to the same combination of poor planning, faceless bureaucracy and political expediency described in your reporting.

There are alternatives to the project, but the Corps, of course, seems to have spent more effort ignoring them than studying them.

Pete and Sharon Pollaczek
and Grant Hodgson
Days Creek, Oregon

I found both articles on the Army Corps of Engineers maddening and frustrating. Complaints against this public-works-minded organization go back to the time it was originally formed. Still, nothing has been done about the Corps' perpetual outrages. Your writers eloquently managed to point out the abuses and failings of the Corps, but nowhere do they suggest means of taming the tiger. What can be done?

R. Gordon Hershey
Bloomington, Indiana

As an original subscriber, I have sat placidly in my tranquil Connecticut home and read many articles which, while being informative and very, very interesting, rarely touched my life.

However, you finally found the right subject to stir my blood. It's those semidictators, the U. S. Corps of Engineers. We have property that borders one of their flood project dams and we have many stories to tell about their "reasonableness."

Thanks for telling it like it is. It's about time someone rattled their cage!

Would you believe this? My husband asks that you please not use my name if you print any of this—that character who is in charge of the local dam would love to retaliate.

Name withheld
Harwinton, Connecticut

Eating the loch

Thank you for Lawrence Wright's Final Tribute to the Loch Ness monster (October 29). Some years ago, I sat by Loch Ness for several days and decided that the Loch Ness Investigation Bureau workers were having such a hard time locating her because while they were watching the center of the loch, they nonetheless could not see far enough in either direction. I wrote to them, suggesting they draw the loch closed with rawhide to form two 12.5-mile bodies of water.

Here's their reply: "It might require less force (and rawhide) if we just filled the loch with jelly crystals, drop in a 10-ton maraschino cherry, and issue spoons to all the kids in the U.K. and let them eat the beasts out."

Lowell Darling
Vancouver, British Columbia

Victims of the hunt

I read with great astonishment and concern your article "When hunters become the hunted" (November 12). As a life member of the National Rifle Association, I agree with your suggestion that *all* states should have and require NRA-approved hunter safety programs, which are currently utilized in some states. Only by these measures can true sportsmen and hunters affect a stop to this needless slaughter.

However, I do not think the people involved in many of these accidents should not be termed "hunters." They can only be victims of their own anxious ignorance of proper firearms handling. True hunters seldom have these accidents.

Thomas J. Bartlett III
Owensboro, Kentucky

Continued on page 12

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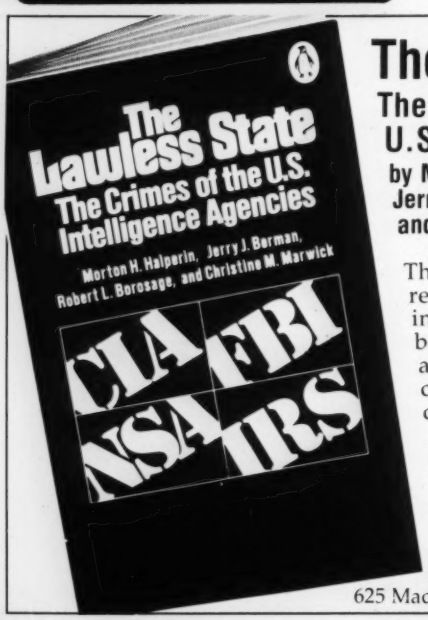

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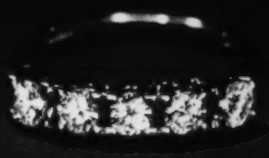

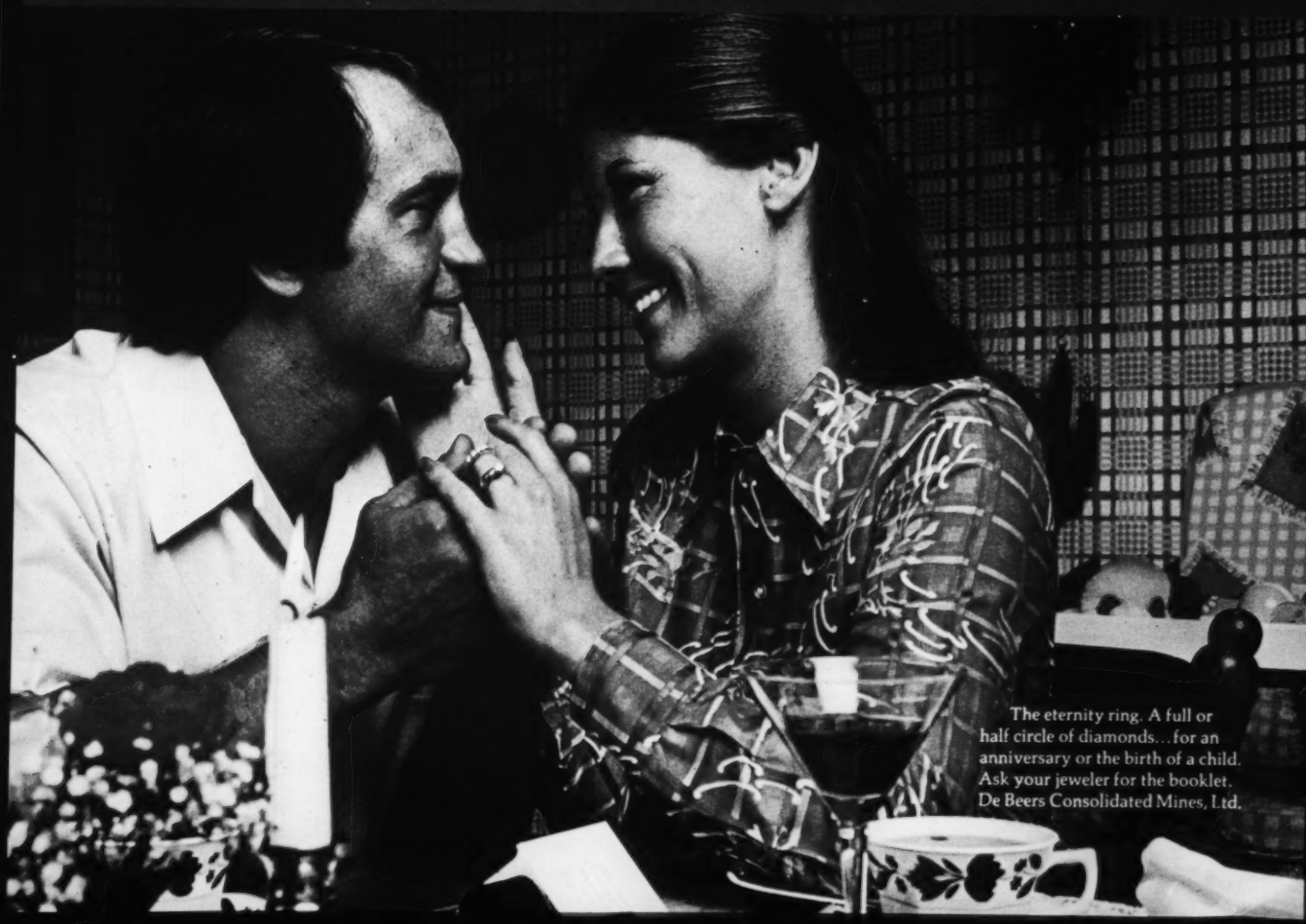

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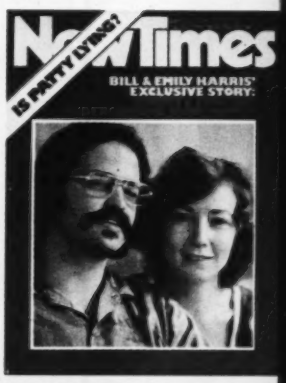

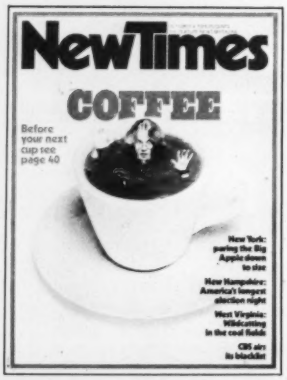

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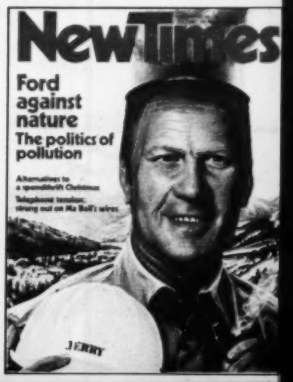

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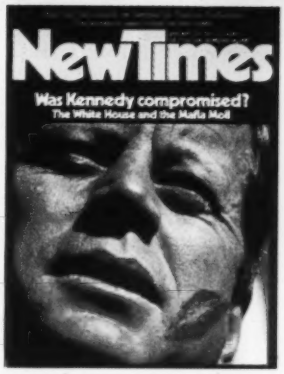

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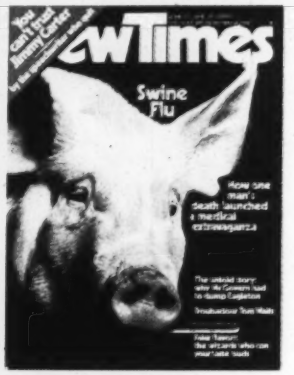

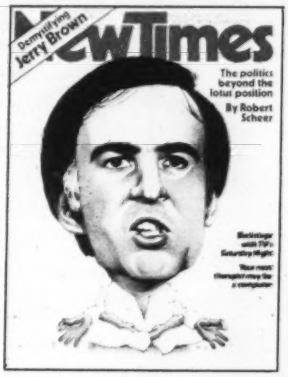

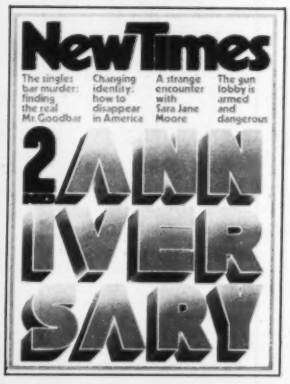

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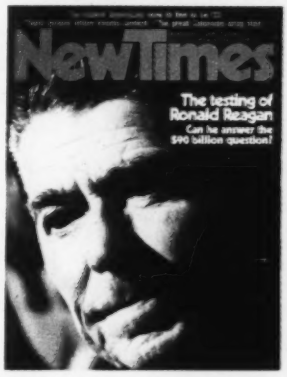
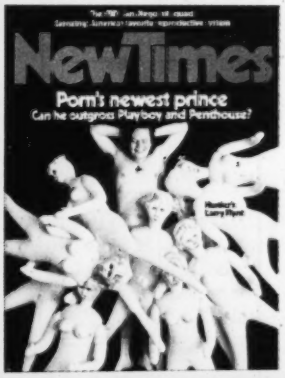
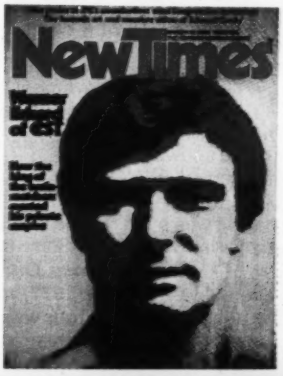
Psychobabble: the new jargon of candor
"WHAT AN INCREDIBLE TRIP! I'M REALLY GETTING MY HEAD TOGETHER. I'M IN TOUCH WITH MY FEELINGS, YOU KNOW? I'M SORT OF IN A WEIRD SPACE."
"VERY HEAVY."







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Craig Waters' article is a valid exposure of unqualified hunters. However, in focusing on people who shouldn't be allowed in the woods (or anywhere) with a gun, he bypassed those of us who are worthy of that all-American definition—hunter. We are just as sick about all those overzealous city-slicker types who cause such tragedy.

I love to hunt game and take pride in my weapons. I use every animal bagged to the last package of meat. We are not all crazed fiends lusting blood, as your statistics prove. Granted, there does exist a serious problem, and it won't be an easy one to solve. Any sensible suggestions?

Lori Aschenbrenner
Enterprise, Oregon

Hunting is no longer what it was. Hunting is no longer a direct necessity of life as it was in my great-grandfather's time. Now it is bent; now it is an indirect need—a miniscule part of an overall drive to satisfy manhood. Disgusting, isn't it? Disgusting that we should, with all we have to do and draw from in this life, spend our time "hunting."

Thomas E. Buschman
Jefferson City, Missouri

Corn mystique

Why didn't Carol Caldwell just say in her Final Tribute (November 12) that all the Yankee press hoopla about the quintessential South has been more of the South as art object for the Northeast, more of the "can't-see-America-for-the-skyscrapers" mentality? If you, Ms. Caldwell, were trying to say that provinciality in Yankee literati is hard to handle, d'accord. However, what is it we expect from those "erudite arms" anyway? Divinity? Truth? Objectivity? Personally, I find Iowa exotic—call it corn mystique. All those wallowing-in-grit mystiqueisms, though I realize you were intending them to be facetious, made me think, Ms. Caldwell, that you doth protest too much, ma'am.

Laurel Crone Sneed
Shallotte, North Carolina

One of the Ten

Under the guise of a film review of *The Front* (October 29), Richard Corliss parades his elitism and spews his venom in the new re-revisionist fashion set recently by Hilton Kramer in the *New York Times*. Perhaps it was a mistake to expect a little better from *New Times*.

Corliss wallows in the sort of semanticism so dear to the hearts of right-wing liberals: he speaks of those who refused to bow to the House Un-American Activities Committee as some of the film industry's "more wily leftists." What manner of divining rod does he have by which he distinguishes "wily" from unwily leftists?

His quotations from Murray Kempton's book are as vicious as they are false. There was no "trial" of any kind; Alvah Bessie did not "morosely claw" at me, nor did I "tear" at John Howard Lawson. Kempton's words, "They were walking toward a common grave, hating each other," are equally untrue. The hatred was Kempton's, and now Corliss', and the grave that is being dug by them is that of respected journalism.

Finally, Corliss says of the Hollywood Ten: "To protect their beliefs the Ten lost their jobs and went to jail." That too is a distortion. We fought to protect the rights of all people as guaranteed under the First Amendment. It was a good fight, one to be proud of. Those of us still here do not regret it.

Lester Cole
San Francisco, California

The presses are rolling

I was delighted to read what a fine poet I am in Louise Bernikow's article on women poets ("Out of the bell jar," October 29) and enjoyed it until I came to the part about how my press is defunct. I beg your pardon.

I hear this periodically, but it never fails to astonish me. In this year alone we have revived George Sand—the first of her works to be published in English in 46 years. We have brought out two books by Ntozake Shange; one the amazingly successful choreopoem, "For Colored Gils Who Have Considered Suicide/When The Rainbow Is Enuf." We continue to do a yearly anthology of women's writing. Defunct, huh. Compared to who.

Alta
Shameless Hussy Press
San Lorenzo, California

A national loss

Robert Shrum's recap of losers in this year's elections (Party Lines, November 26) points out that there was only one loser: the whole nation.

Rus Purifoy
Odessa, Texas

DOUBLE ISSUE: You're holding the first year-end double issue of *New Times*. Our next issue, dated January 21, 1977, will be mailed to subscribers in four weeks. Happy holidays.

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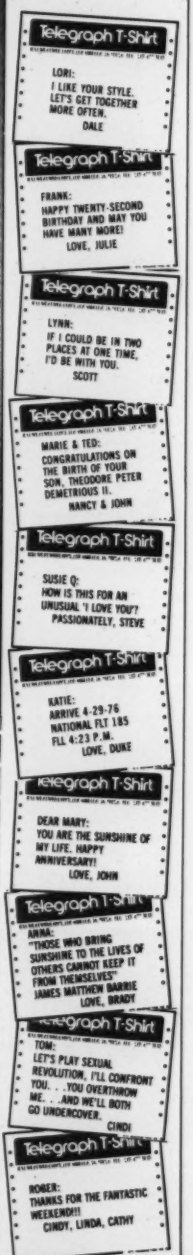
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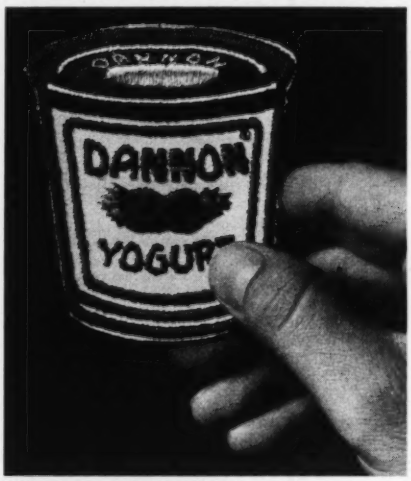

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NEW TIMES PRESENTS THE FUTURE

Be Here Now, recommends Ram Dass. Swell. The only problem is that Now is already Then, passé before the advice can be usefully assimilated.

And if the present is quicksilver, the past is deader than the butts in your Bicentennial ash tray. Everyone knows about yesterday's mashed potatoes. The question is, what about tomorrow's? Intertace it: the future is where it's at. If only you knew what *it* will consist of.

Relax. We know. Better still, we're about to tell you.

What's that you say—the future can wait, you'll get your act together next century? Sorry, but that won't do at all. No, you'd best get ready now, because faster than a speeding laser, the future is approaching: in 1984, Jimmy Carter will still be in his second term; in 2001, Amy will be but 34.

And you? Will you know the niceties of trisexual foreplay or the difference between an androgyne and a crossdresser? Whether to use a laser on an eye or an I-beam? How to fool the actuarial tables or run from pathogenic plasmids? Where to find hard-core holograms or made-to-order babies? The difference between your living center and centered living, between future shock and future schlock?

Believe us, there's no time to lose. So read on. The best—and worst—is yet to come.

That the backward and poverty-stricken Third World should transform the affluent and sophisticated West may seem a preposterous notion, but don't laugh yet

THE THIRD WORLD RISING

By L.S. Stavrianos

The jarring spectacle of Ambassador Graham Martin fleeing Saigon in April 1975, American flag tucked under arm, symbolized the shifting balance of power in Southeast Asia. But at the same time an equally dramatic event of much greater significance was taking place in Cambodia: the forced evacuation of the inhabitants of Phnom Penh by the victorious Khmer Rouge. Within hours the exodus was underway, and in a few days all of the two-and-a-half million citizens were gone, including infants, the aged and the sick in hospitals. Westerners referred to it as "a death march"—as "genocide by natural selection." Large numbers inevitably would die during the trek into the interior, and this, it was argued, would relieve the revolutionaries of "useless mouths to feed."

This reasoning did not square with reports that not a single corpse was spotted along the roads from Phnom Penh to the Thai border. Then William Goodfellow of the Institute for International Policy, who left Cambodia with the last American contingent, explained that the evacuation of the capital "was a journey *away* from certain death by starvation." Under the former government, the capital had become dependent on American rice imports; what's more, Goodfellow pointed out, "starvation was already a reality in the urban centers, and widespread famine only a matter of weeks away."

A year later Sweden's ambassador to Peking, Kaj Bjork, made a tour of Cambodia, the first Westerner to do so since the Communist takeover. He found a country that was even more revolutionary than Maoist China. There were no private shops, no individual peasant plots, no money in circulation and no wages for work. The uprooted urbanites had been directed to rural areas where they were assigned shrub land or jungle to clear and plant with rice. The ambassador

Enthusiastic Chinese peasants march in Peking's Tien An Men square. The transformation of Chinese society illustrates the Law of the Retarding Lead: backward countries can blaze the trail to the future.

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In Jamaica, the poverty of the shantytown population (top left) contrasts luridly with the wealth of the local businessmen and visiting tourists (top right). One reason for Third World poverty is the single-minded cultivation of one crop, like coffee, for export (bottom left). In China (bottom right) and other countries, this trend is being reversed, and more attention is being devoted to food production for local needs.

saw no signs of starvation. Until the crops were ready the refugees received daily rations of rice and salt, which they supplemented with whatever edible roots they could find. Two or three times a week, they attended political instruction sessions to learn the basic lesson that all Cambodians are equal and therefore all must grow their own food. What they produced they could exchange with others. Later the government would purchase their surplus and thus again put money into circulation. The middlemen who disappeared with the evacuation of the cities would not be allowed to reappear; life in the future would be organized along cooperative lines.

The 1975 Phnom Penh exodus represented the purposeful uprooting in two or three days of over a century of Western rule and influence

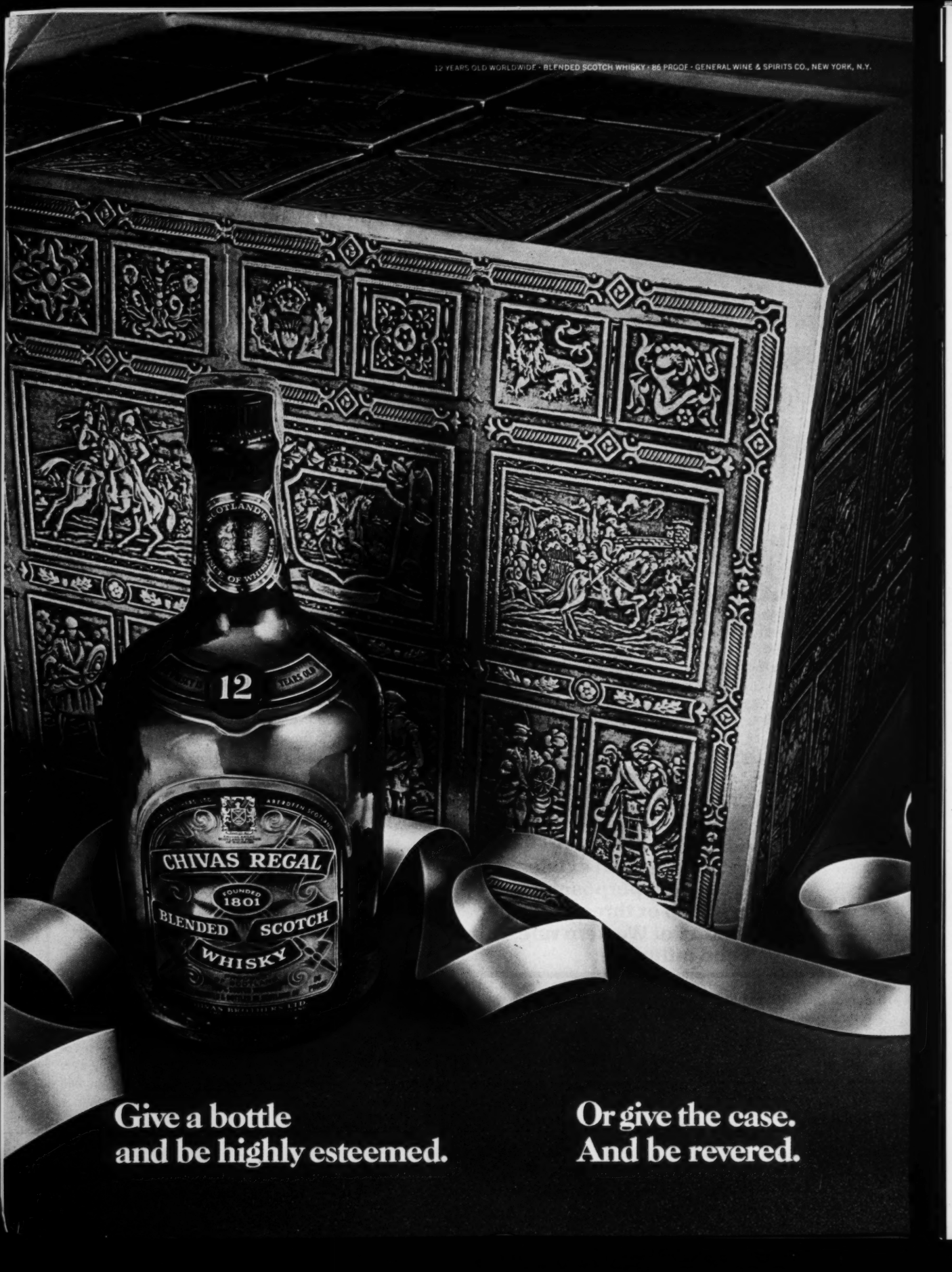
In retrospect, the significance of the Phnom Penh exodus is clear. It represents the purposeful uprooting in two or three days of over a century of Western rule and influence. The Khmer Rouge leaders, who imbibed their Marxist doctrine in Western universities, have expressed their aims unequivocally. They want to erase everything represented by Phnom Penh, "that harlot on the Mekong." In its place they envisage "a new system that is sound, clean, free from corruption, and in which there is no hooliganism, graft, embezzlement, gambling, prostitution, alcoholism."

Phnom Penh is important because it is not an aberration. It is just one manifestation of a growing Third World movement that repudiates not merely Western political domination but Western civilization itself, or at least those manifestations of Western civilization that have taken root and flourished in the Third World during the half millennium following the voyages of Christopher Columbus and Vasco da Gama. The Bishop of Oporto, Gomes Fereira, has defined this seismic upheaval, which will dominate global affairs in the foreseeable future. "What escapes most observers," he forewarns, "is that we are not living through a small mutation, but a total rupture, a trauma that breaks with 500 years of history."

In 1825 the British foreign minister, George Canning, after recognizing the independence of the new Latin American states, boasted that "I called the New World into existence to redress the balance of the Old." To the distress of our modern-day Cannings, another "New World" is now emerging. Today's New World is global in scope, and it directly challenges the traditional dominance and the basic premises of the Old World. To a much greater degree than Canning ever imagined, this new New World indeed will "redress the balance of the Old"—and the old may never be the same again.

That the backward and poverty-stricken Third World should transform the affluent and sophisticated West may seem patently preposterous. Yet it is just this poverty and backwardness that gives the Third World the freedom to strike out in new directions. Or, more precisely, poverty pro-

L.S. Stavrianos, adjunct professor of Third World Studies at the University of California, San Diego, is the author of The Promise of the Coming Dark Age.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vides isolation from the global market economy, lowering the vulnerability to external economic and political pressures and increasing the freedom to innovate and restructure. Consider the great revolutions of our century. The 1917 Bolshevik Revolution would have been "strangled in its cradle," as Winston Churchill wanted, had czarist Russia not been a relatively unindustrialized peasant society. Its years of revolution, civil war and foreign intervention reduced 1920 steel, cotton and sugar production to about 5 percent of their 1913 levels. No Western industrialized power could have survived such a catastrophe, but the Bolsheviks pulled through because four-fifths of the population lived on farms and the remaining fifth could return to the villages as a last resort.

The same was true of the Chinese revolution. The United States and then the Soviet Union sought to crush Maoism, but the hundreds of millions of peasants prevailed, regardless of who controlled the cities and communications routes. Tempered by mass activism and mobilization, backwardness was invulnerable. Southeast Asia offered the next test. According to McNamara's computers, the sheer weight of overwhelming manpower, firepower and electronic gadgetry should have annihilated Ho Chi Minh's followers. But in contrast to Western societies, which would have crumbled before such an onslaught, Southeast Asia was like the primitive planarian worm: when cut in two, each half regenerates the missing part.

Of Chile, Kissinger said that he didn't "see why we need to stand by and watch a country go Communist due to the irresponsibility of its own people"

The latest beneficiaries of underdevelopment are Portugal's former African colonies, the most retarded in the Third World on the basis of any criteria—literacy, technology, urbanization or social services. Again it was their very backwardness that enabled subsistence-level peasants to organize and run revolutionary struggles unequaled in the more advanced but also more vulnerable regions of Africa and Latin America.

The significance of these revolutionary successes in the most retarded regions of the Third World becomes apparent when contrasted with recent developments in Chile and Italy. Salvador Allende was elected president on the basis of a program that called for "putting an end to monopolistic capital, both Chilean and foreign . . . so as to begin the construction of socialism." But because Chile depended on foreign markets for copper, on foreign banks for capital and on foreign industries for armaments, it was possible for Allende to be overthrown and a military dictatorship established. The subversion of Chilean democracy, according to public testimony, was planned at top United States governmental and corporate levels, and was executed under the direction of Secretary of State Kissinger, who stated flatly that he didn't "see why we need to stand by and watch a country go Communist due to the irresponsibility of its own people."

Equally revealing is the case of Italy, where the Communist party on two occasions seemed likely to win electoral victories. Five weeks before the 1948 election the National Security Council in Washington recommended strong retaliatory action "if the Communists get domination by legal means." The proposed measures included limited mobilization, financial and military assistance to the anti-Communist Italian underground and opposition to Italian membership in the United Nations. Similarly, when the Communist party again seemed close to electoral victory, the United States, West Germany, France and Britain reached an informal understanding at their June 1976 economic conference in Puerto Rico: to bar new loans to Italy if Communists were admitted into the cabinet. In an article in the *Washington Post*, former Undersecretary of State George Ball spelled out in detail how an Italian government with Communist members could be "destabilized." He suggested financial quarantine, restrictions on agricultural imports, boycott by multinational corporations and expulsion from the common market. "Italy could quickly find herself in a severe financial panic," he warned, "with mounting inflation, labor strife and increased unemployment."

All this brings to mind what the anthropologists refer to as the Law of the Retarding Lead. According to this law, the best adapted and most successful countries have the greatest difficulties during transition periods in adapting and retaining their lead in world affairs; conversely, the backward and less successful societies are more likely to adapt and lead in the transition process. In medieval times, it was the affluent and sophisticated Chinese Empire that proved too set in its ways to change its values and institutions, while the primitive frontier society in Western Europe, because of its backwardness, was free to evolve a new civilization which eventually dominated the globe.

Mankind is once more in the middle of an epochal transition. In recent centuries, values and institutions were evolved to maximize capital accumulation and technological growth. Now the priority is shifting from accumulation to rational and humane use of what has been accumulated; values and institutions once successful are now counterproductive. So the retarding-lead effect is at work again, this time favoring underdeveloped China and other Third World countries against the developed West and Soviet bloc.

We need to reassess the role of the Third World in our times. During the immediate post-World War II years, it was generally assumed that the Third World must depend on the industrialized countries for funds and programs. Among those sharing the assumption was the Third World itself, and the end result was disaster. The utter failure of the Development Decade of the 1960s, together with mounting problems in the developed countries themselves, demonstrates the fallibility of foreign economists. In line with the Law of the Retarding Lead, it may turn out that the Third World in forthcoming decades will be a center of creative initiative, working out new answers to our common problems.

The economic dilemma of the Third World was strikingly illustrated in the early 1970s, when emergency food shipments were sent to sub-Saharan Africa to relieve the devastating effects of drought and famine. That emergency, however, obscured the fact that Africa had for years been a net importer of food, falling shorter of meeting its food requirements than any other continent. And this despite the fact that the percentage of the African population engaged in agriculture is the highest in the world. While Africa's export crops are booming, its food production for home use is stagnant or declining.

The paradox stems from Africa's dual agricultural economy, which is the curse of most of the Third World. This involves a sharp division between large-scale, profitable, capital-intensive production of a few export crops and small-scale, labor-intensive peasant production of local food requirements. The dualism was deliberately fostered under colonial rule to assure foreign investors a lucrative return on

their capital, to create a base for tax revenues needed for colonial administration, and to satisfy the needs of European industries and consumers. And so African regions that traditionally had been self-sufficient now found themselves neglecting their old food crops in order to maximize cocoa exports in Ghana, cotton exports in Chad, coffee and tea exports in Kenya, Malawi and Uganda, and so forth.

The native populations had no say in the switch from economic independence to subordinate status in the global market economy. The colonial governments (as well as the subsequent states) focused their resources and services—road and railway systems, irrigation projects, marketing agencies and direct and indirect subsidies—toward stimulating the production of export crops. By contrast, peasant food growers still use tools and techniques harking back to neolithic times.

Most Third World governments are more concerned about satisfying foreign cashew nut munchers or tea and coffee drinkers than about feeding their own populations. Ironically, when peasant farmers are given the least opportunity, they can outdo the large plantations in terms of output per unit of land and cost per unit produced. In Kenya, for example, native peasant families nearly doubled the output of farms formerly operated by European settlers. And yet the old dual agricultural system persists in most of Africa and the rest of the Third World. The explanation, of course, is not stupidity or malevolence on the part of Third World policymakers, but rather the political power of numerous vested interests, foreign and local, that profit from these export-oriented economies.

Most Third World governments are more concerned about satisfying foreign cashew nut munchers or tea and coffee drinkers than about feeding their own populations

Today, the Third World must find a way to subordinate existing economic linkages to foreign economies in favor of new internal linkages between the various sectors of the domestic economy. The current, primarily external economic ties are responsible for the Third World's one-crop economies, which produce only minerals and agricultural goods for export. Because they are inherently incapable of overall integrated development, these economic structures have resulted in a rapidly widening gap between developed and underdeveloped countries. The differential in per capita income was roughly three to one in 1800, about seven to one in 1914, and twelve to one today.

One Third World response to this "global economic dictatorship" is the OPEC strategy of obtaining more favorable terms of trade by organizing cartels of countries that export raw materials. Another and more basic response is domestic economic and social restructuring to foster independent economic development.

This policy does not rule out later economic relations with the outside world, but first there must be "some degree of closure," to use the phrase of economist George Beckford of the University of the West Indies. A preliminary closure period is essential to allow time for diversifying and developing the local economy. Only then will it be possible to enter into economic relations with the developed world that are mutually beneficial rather than exploitive.

In Cambodia, economic closure, as we have seen, involves self-sufficiency in food production and gradual industrialization of the countryside. In China, where closure, or Mao's "self-reliance," has been practiced for decades, a variety of new practices and institutions have evolved: worker participation in factory decision making, self-sufficient and self-managing communes, physical as well as mental work throughout the educational system and preferential treatment for rural areas.

Such innovations are gradually and inexorably restructuring the international economic order that evolved during the past several centuries. The new order will mean more self-reliance, more autarchy and less international trade. It will mean an end to the familiar statistic of 6 percent of the world's population consuming one-third of the world's energy and raw materials. It will mean an end to ecological imperialism, in which industrial societies degrade Third World ecosystems by excessive use of pesticides and fungicides and by concentration on a few "miracle" strains that are vulnerable to plant diseases. It will mean a return to the diversity and stability of local and regional ecosystems at the expense of a complex but ultimately self-destructive global market system. In an understatement for all seasons, Henry L. Duncombe Jr., vice-president and chief economist of General Motors, declared at a conference last summer in Aspen, Colorado: "We're beginning to recognize that the capacity of the transnational companies to solve the world's major problems—of food, unemployment and the building of infrastructures—is more limited than we had thought."

In the realm of politics also, the Third World began by accepting Western constitutions, bureaucracies and codes. Again their irrelevance and inadequacy quickly became apparent. They facilitated the substitution of one ruling elite for another; the only difference between them was one of color. If anything, the new native elites were likely to be more corrupt and exploitive. It was soon realized that the colonial powers had granted independence selectively, rejecting nationalist leaders who were also social revolutionaries, and who would have jeopardized the vested interests dependent on the dual economies. Likewise "foreign aid" was extended selectively. It was lavished on Emperor Haile Selassie of Ethiopia but not on Julius Nyerere of Tanzania, on King Hussein of Jordan but not on Abdul Nasser of Egypt, on the generals ruling Brazil but not on Salvador Allende of Chile.

This selective granting of independence and of aid ensured a succession of ruling elites in the Third World. This sequence was broken by the revolutionary regimes in East Asia, Southeast Asia and southern Africa. A qualitative change has occurred with the emergence of new leaders and movements dependent on mass activization and participation. Precisely what this means in practice has been set forth by the North Vietnamese leader Nguyen Khac Vien. It is easy enough, he warns, for technicians to prepare blueprints, for economists to formulate plans and for politicians to legislate. But the real problem is to transform all this into reality, and this task can be done only by the peasants. To galvanize the peasants for this undertaking, the North Vietnamese leaders are waging a two-pronged campaign of "rectification" and "emulation."

"Rectification" means simply the holding of mass discussion meetings where everyone can discuss his or her daily problems: how to modify the old method of planting rice, how to change the blade on a plow, why cooperatives are desirable, why manure and human waste should be collected for fertilizer, why polygamy and child marriage are forbidden. Each person can criticize the ideas of others, so that useful information is transmitted and errors corrected.

When the rectification process is completed, the "emu-

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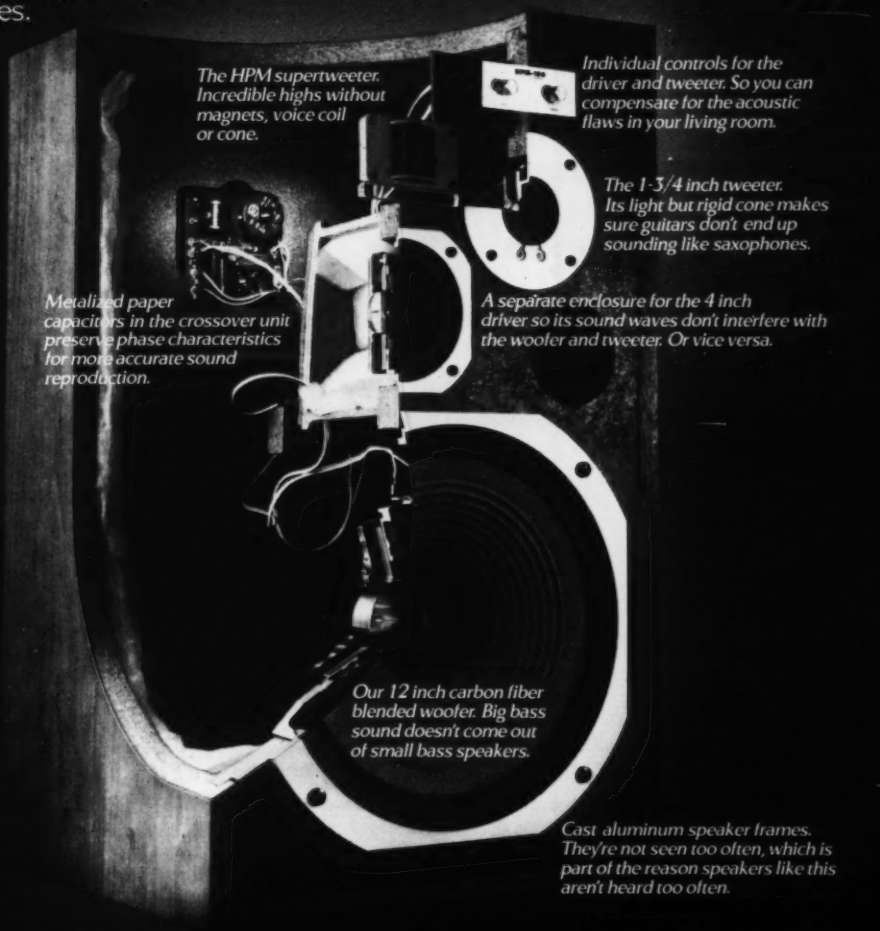
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lation" campaign begins to implement the consensus. This is the "doing" stage, when obscure peasants suddenly become famous because they have collected so many tons of fertilizer, or found a better way to breed water buffalo, or broken records in the yield of their rice paddies. Their names and achievements fill the newspapers and magazines, and thus concrete personal experiences become guiding standards. Vivid slogans are popularized to drive home the principles of the emulation campaigns: "Free your shoulders," to persuade peasants to build wheelbarrows; "Clean villages mean well-manured rice land," to induce villagers to collect garbage and manure; "Break the chains of the one-tenth hectare," to stimulate peasants to clear more land for cultivation.

In this way, explains Nguyen Khac Vien, rectification and emulation prepare the Third World peasants for their leap into modernity. "There is no question," he concludes, "that for developing countries, liberty is the most precious of all blessings—and not negative liberty which demands 'leave me alone,' but a true liberation of spirit and energy."

The "true liberation" extolled by Nguyen Khac Vien is integrally linked with the "dictatorship of the proletariat" and has no room for the individual liberties and political pluralism cherished in the West. Revolutions, by definition, produce losers as well as winners. In the current Third World revolutions, the peasants and workers are the winners, while intellectuals, artists and writers can function creatively only if they accept the consensus of rectification and participate in emulation. This distinction between "negative liberty" and "true liberation" may remind Americans of the Soviet principle of "democratic centralism," which in practice has provided conspicuously little democracy. And yet the grass-roots political effervescence in the Third World is no fiction. It has transformed daily life in countless small villages, and it has created hopes for even more radical changes.

Economic and political restructuring in turn requires cultural restructuring, the inculcation of new values—the creation of a new man motivated by the desire for communal service rather than personal gain. That grand aim lies behind Maoist slogans denouncing the "private ownership of knowledge" and insisting that "the new man is the prerequisite rather than the end result of the new society."

The personification of this "new man" in China is the young soldier Lei Feng, who was glorified by Mao and became a national hero. During his short life, before he was killed in an accident, this Chinese Frank Merriwell performed an interminable list of good deeds. He kept his army truck in perfect condition, contributed his meager pay to flood victims, worked in his spare time on public projects, carried a peasant's child for miles in a heavy downpour, and always avoided acclaim or reward. "Learn from Lei Feng," urged Mao, and the fact that he selected a common soldier rather than a famous general or revolutionary hero to serve as a national model is itself significant. What is important is not brilliant talent or spectacular exploit, but rather the dedication of self to the collective good. "We must all learn the spirit of absolute selflessness," taught Mao. "A man's ability may be great or small, but if he has this spirit, he is already whole-minded and pure, a man of moral integrity, and above vulgar interests."

Such teaching is not unique in the history of religion or ethics, but what is unique is the degree to which it has been accepted and internalized by a quarter of the human race. A foreign correspondent who saw a film on the life of Lei Feng noted that the audience leaving the theater was wet-eyed. He remarked to Chinese friends as tactfully as possible that such canonization of a young soldier seemed extravagant. They in

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BitterSweet
Surviving and Growing from Loneliness
by Terri Schultz

turn were incredulous. "But we haven't invented anything," responded one friend. "Lei Feng really existed . . . there are hundreds of thousands of Lei Fengs in China, and we congratulate ourselves on this."

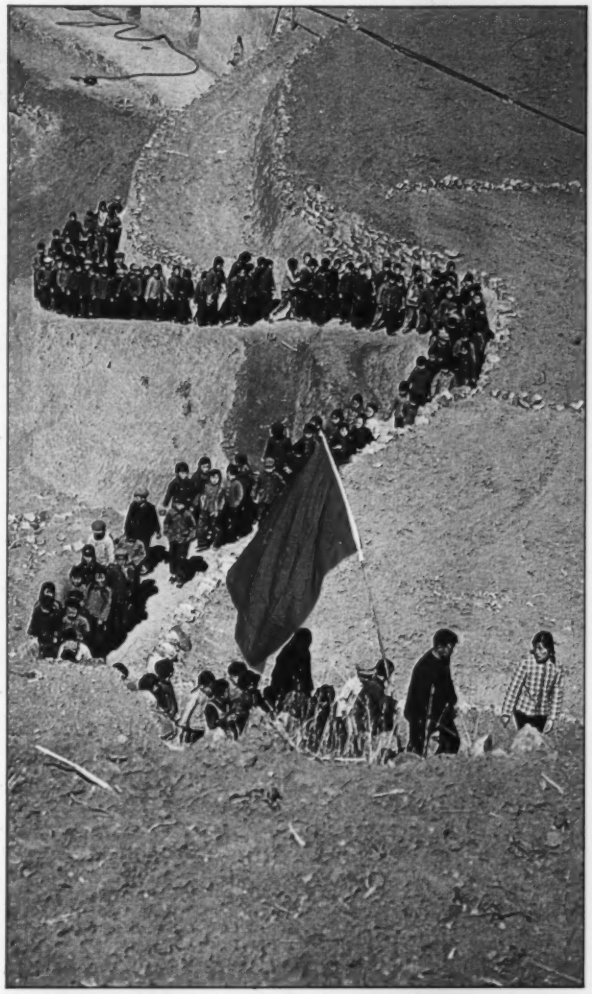
Such didactic moralizing and relentless indoctrination is cloying and disturbing to the American attuned to Lenny Bruce's quip, "It's time to grow up and sell out," and Archie Bunker's exasperated shout to his too-good wife, "Go ahead. Be human. Do something awful." But it is this social commitment that makes China today as different from the Soviet world as from the Western. To a much greater degree than dams or factories or full bellies, it is the "hundreds of thousands of Lei Fengs" that have so impressed foreign observers of all political persuasions.

Alberto Moravia, the Italian novelist, observes in *The Red Book and the Great Wall* that his overwhelming impression of China was of poverty and a sense of relief—relief because it was a poverty that produced not human degradation but a "humanly intact man" engaged in a communal effort to improve his lot and that of his fellowman. Norman Webster, *Toronto Globe and Mail* Peking correspondent, when asked about Mao's objective, replied, "I believe he's trying to make a Christian out of every person. This is something no one else has ever really tried to do—at least on such an extensive scale." Rev. William VanEtten Casey, former editor of *The Holy Cross Quarterly*, recalls the 1552 letter of his Jesuit predecessor in the Far East, St. Francis Xavier: "Opposite to Japan lies China, an immense empire enjoying profound peace, and which, as the Portuguese merchants tell us, is superior to all Christian states in the practice of justice and equity." "It is ironic," adds Father Casey, following his own 1975 visit to China, "that these words apply so aptly today . . . Mao's China is an immense country, enjoying profound peace, and superior to all Christian states in the practice of justice and equity."

A new world indeed is "redressing the balance of the old." It does not follow that the old world is passé and doomed. This was the apprehension of the late Jacob Bronowski in concluding his generally optimistic *Ascent of Man*. The next steps forward by the human species, he speculated, "might be taken by people elsewhere, in Africa, in China." And then he added poignantly, "I should feel it a grave sense of loss if a hundred years from now Shakespeare and Newton are the historical fossils in the ascent of man, in the way that Homer and Euclid are."

It is unlikely that Bronowski's foreboding will prove justified, and the reason is that the world today is more unified than at any time in the past. No longer is it possible for civilizations, as in the days of the pharoahs, to languish in millenia-long decay, isolated from any outside influence or intervention. We are living in an age in which any significant breakthrough in coping with human problems quickly becomes common knowledge and is imitated, adapted or rejected. The resulting global cross-fertilization means that the law of hybrid vigor is operating in the cultural realm as well as in the biological.

What we are likely to witness in our time is not the decline of Western civilization into a "historical fossil," but the mutual stimulation of all societies. In this age of unprecedented change, the crumbling ruins of the past are visible everywhere, but so are the green shoots of the future. Perhaps we should pay less attention to learned and prestigious Cassandras, and more to an unlettered Chicano labor leader. "You know what I really think?" declares Cesar Chavez, "I really think that one day the world will be great." ●



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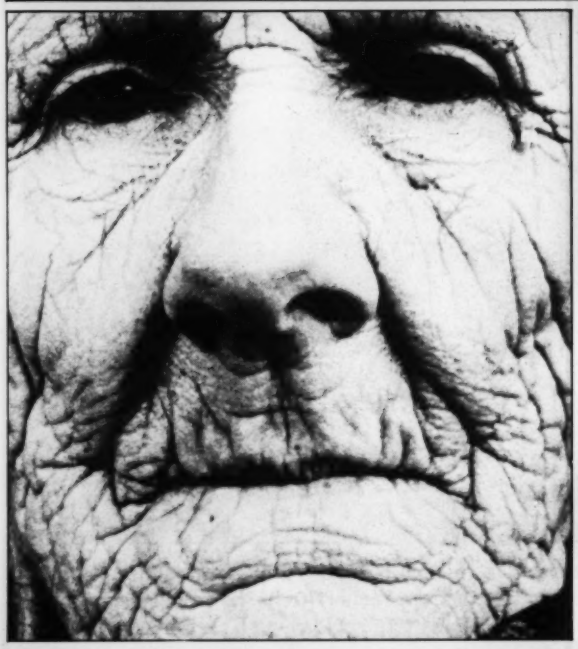
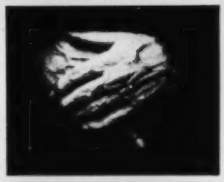
Chinese schoolchildren visit a model agricultural commune to "learn from Tachai" (top). The model for selfless conduct is the martyred soldier-hero Lei Feng (bottom).

GRAND MARSHAL





EXIT

You can't expect eternal youth, and probably don't want a desiccated dotage that teeters on indefinitely. But there is increasing hope for an old age that lasts longer and is more vigorous. Here's what you can do to achieve it

NEW WRINKLES IN THE SCIENCE OF AGING

By Michael Halberstam

Consider, for a moment, your body: your fine, sleek skin; the limber joints and muscles that give you your sprightly step; your marvelously quick nervous system that allows you to scratch your head and chew gum *simultaneously*; the intricate sexual mechanism of hormones, anatomy and fantasy that allows you to get what you want with delightful, if not absolute, dependability.

Then think of your body 30 or 50 years from now. Imagine, if you can, your future skin, joints, arteries, nervous system, sexual apparatus. Do you see some kind of wrinkled, stunted, creepy-crawler, the inevitable result of an inevitable process? If you do, you're in the majority, and you are also (perhaps unknowingly) a philosophic follower of Leonard Hayflick, who is a pretty good person to be a follower of, since he is a brilliant experimenter in the field of cellular biology. On the other hand, if you suspect that much of what lay people and most scientists call "inevitable aging" is a disease and thus no more inevitable than the smallpox epidemics that used to wipe out a couple million people yearly, then you are an "expansionist," an ally of Bernard Strehler of the University of South Carolina and Alex Comfort, both of whose scientific credentials are impeccable and both of whom believe that much of aging can be controlled and lifespans extended, clearly to 100 years, and perhaps more.

Think of it! There's a biologic-philosophic battle wag-

PHOTO CREDITS: TOP ROW LEFT TO RIGHT KENNETH MURRAY/NANCY PALMER PHOTO AGENCY. RHODA GALYN/PHOTO RESEARCHERS. RAY ELLIS/RAPHO PHOTO RESEARCHERS. SECOND ROW L TO R JAMES JOERN. J. BERNDT. THIRD ROW L TO R ERIC KROLL. TOP KEN KOBRE. BOTTOM – DIANE KOOS GENTRY/BLACK STAR. J. BERNDT.

ing around the future of your body, and it's a dispute that, while conjuring up the most profound issues about God and nature, can be understood by all of us whose futures are at stake. There are some specialists who believe that mankind is biologically preprogrammed to grow old and die at a certain inevitable rate and that, even if all disease processes were removed, survival after age 90 would almost never occur. Hayflick is among these, since he found that cell cultures, no matter how perfect their environment, show constant, accelerating disintegration. Furthermore, many of these same experts believe that there is a reason for this—nature or God doesn't like people hanging around too long after their reproductive ability is over. Too many elderly, nonreproducing members of a society put a burden on that society, not merely in Social Security payments and Medicare, but in the more fundamental sense of slowing the society's reproductive rate. The quicker a society turns itself over, the theory goes, the more completely and rapidly it eliminates unfit traits and breeds successful ones. Adherents of this theory cite voluminous data from animal and experimental cell research to support their ideas.

There is an opposing school, however, which argues that if death is inevitable, it isn't *that* inevitable. There is no question, after all, that occasionally humans live to be bright and perky well past 100, and, if some do, there is no biologic reason why more cannot. Furthermore, since most of these oldsters live rural lives and reached their great age in the absence of modern medical care (some would say *because* of the absence of modern medical care), there is no logical reason why science could not identify the longevity factors in such lives and combine them with judicious medical intervention to make extreme longevity commonplace. These specialists argue that old age itself does not have to be a period of frailty—certainly not the living death that the average American imagines it to be. What's more, they charge that it is self-defeating and presumptuous to claim that aging and death are part of nature's plan. Nature's plan for mankind may be different from her plans for fruit flies, mice and chimpanzees. Adherents of this theory cite voluminous data from animal and experimental cell research.

Caloric restriction is the most effective life-prolonging method currently known—though its benefits in humans are only inferred, not proven

The problem is that it is difficult to do conclusive experiments on aging in humans (it takes 70 years or so for the results of most research to become apparent), while research in other animals is hard to extrapolate to man. Some general rules do seem to apply: large species tend to live longer than small ones, females in almost all species tend to live longer than males, and vertebrates longer than nonvertebrates. Yet there are enough exceptions to make it clear that nature does not appear to have a single unitary formula for aging. Thus the lobster, comparatively small and definitely nonvertebrate, may live to be 50 years old, while the placid cow, all 1,000 pounds or so, shuffles off somewhere between age 7 and 10.

Michael Halberstam, M.D., practices internal and cardiac medicine in Washington, D.C., and writes frequently about medical topics.

The prolonged period of decreased vigor preceding death does not apply to all species. One expert in aging has pointed out that humans, skunks and porcupines are among the few species that actually "grow old" in a physiologic as well as a chronologic sense. We don't have much information about how wild animals age or what they die of—they get eaten by scavengers before anyone can do an autopsy. Dr. Robert Butler, chief of our National Institute of Aging, points out that many wild animals live an abnormally abbreviated life. "If wild animals had dentists, they might be around a good while longer," Dr. Butler speculates. "In many species, the teeth are the first to go, the animal can't feed effectively, and either dies naturally or is set upon by other animals."

Most species begin their period of old age by losing the capacity to reproduce, but this postreproductive stage is rare in many fish, which keep producing normal eggs right up to the end. The salmon is a classic puzzle for students of aging, progressing from "a stage of vigorous sexual maturity to death from 'physiologic aging' within a few weeks," according to anatomist Warren Andrew. Andrew points out that in a few weeks salmon undergo changes "comparable in many ways to those which take place over a 30-40-year span for the human organism." In their headlong path to senility, salmon even get arteriosclerosis of their coronary arteries, a pathologic condition rare in most nonhuman species.

Even a nonscientist can see the fascination of studies of aging in other species. After all, if we could find what turns the salmon old in a period of weeks we might have a clue to a process that takes years in us. Cats, too, are an intriguing species. Most die before the age of 16, but there have been documented life spans exceeding 30 years. A 30-year-old cat is a curiosity, but a human of 150 years (twice the female life expectancy) would be a marvel. Alex Comfort, who spent years doing brilliant, laborious studies on aging in guppies before writing *The Joy of Sex*, has noted that there are much greater differences between the average and maximum life spans of animals than there are between those of man. We live to somewhere in our 70s, but the bell-shaped curve just about hits bottom at 90. If man were like other mammalian species, we would have a much higher proportion of active survivors in their 90s, and centenarians would be nothing for the local paper to write up.

When animals do live unusually long, hardening of the arteries, which we humans assume to be a "natural" or "inevitable" part of the aging process, is rarely a major problem. The Swiss pathologist Scheidegger cites a 60-year-old vulture with diffuse arteriosclerosis as the only bird he is aware of that has actual symptoms of the disease. Aside from the salmon in its accelerated senescence, fish do not develop arteriosclerosis. In most laboratory species used in research, hardening of the arteries has to be produced artificially by special diets and other manipulation.

There is, then, hope. Not nutty, freaky hope, not hope for eternal youth or hope for a desiccated old age that teeters on indefinitely, but hope for an old age that lasts longer and is more vigorous. The prescient reader will want to know what he or she can do to achieve this, other than donating more money for aging research and hoping "they come up with something" in the next 30 or 40 years. You can start doing something about this right now, and the best way to do this is by focusing on the weak spots in what God gave us.

Do not worry about your kidneys, your liver, or your gut, dear reader. These organs "age" in humans, but never in a way to cause—by themselves—clinical problems. If it were up to our kidneys, we could live practically forever. The normal aging process of the kidneys indicates they are built to last

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at least 150 years—and there are, after all, two of them. Yes, I know your grandmother died of "kidney failure," but this means either that she had a specific disease of the kidneys or, more likely, that the blood vessels leading to the kidneys were diseased. The liver, likewise, does not betray us no matter how old we get. Its ability to clear certain substances from the blood deteriorates with extreme old age, but it has such great built-in reserve capacity that this does not become a clinical problem. We do not get jaundiced as we get old.

There *are* certain anatomic changes that seem just about universal, if not inevitable, with age. The skin is a beautifully supple fabric of cells linked by billions of "stitches" per inch. With age some of the "stitches" lose their elasticity and others begin to unravel. The results are wrinkles. The skin continues to perform its metabolic functions, such as temperature and fluid regulation. It just doesn't look the way it used to. Some people would say the skin doesn't look as good as it used to. This clearly is cultural bias. We believe smooth skin is more beautiful than wrinkled skin because we are taught from infancy that it is. We've begun to accept the idea of "beautiful gray hair." So long as the old skin is doing its job, we might start thinking in terms of "beautiful wrinkled skin." We'll all have it someday, if we're lucky.

A lot of people worry about sexual functioning in later life. Some people worry that they won't have sexual ability or interest, others that they will. The thought that "Thank God I don't have that to bother me" is neither a Socratic original nor pure sour grapes. Few adults would want to return to the writhing horniness of adolescence. But for those who would like to make it on suitable occasions after 70, there is clear evidence that many if not most men remain virile and fertile after this age. "A penis should function adequately until death," flatly states Dr. Benjamin Glover Jr., of the University of Wisconsin, though he concedes that the angle of dangle may change with age. Women remain orgasmic just as long, though they are no longer fertile. Decreased frequency of intercourse with age results in part from other physical problems (arthritis, heart disease, impaired lubrication) and in part from boredom and sexual conditioning. One older woman of my acquaintance said, "Give me a 40-year-old man and there'd be nothing the matter with me."

Arteriosclerosis is very rare in animals other than humans. A Swiss pathologist cites a 60-year-old vulture as the only bird he is aware of to have actual symptoms of the disease

The prescription for preserving sexual functions isn't much fun. You follow the good-health rules learned back in eighth grade, avoid alcohol completely, stay away from drugs and stop smoking. There is no evidence that any kind of vitamin in any kind of dosage improves sexual functioning.

Many theories of aging focus on the body's occasional failure to exactly duplicate chromosomal material at the moment a cell splits. The body makes billions of new cells daily until the moment of death. This capacity for continued regeneration is one of the theoretical bases for a greatly expanded life span. But not all the body's renewal efforts are helpful. Normal skin cells pile up in irregular patterns to produce the lumps and bumps ("keratoses") seen in many older people. Fibrous tissue in a man's prostrate gland expands, eventually interfering with the flow of urine from the bladder. And, the theory goes, as more and more mistakes are made in the division of the double helix, numerous faulty cells are formed and eventually the entire organism becomes nonfunctional.

One kind of failure of cell duplication results in cancerous cells. Malignancies increase with age, but are not an inevitable consequence of old age. Indeed, some cancers seem *less* frequent in the elderly. If you don't have lung cancer by 80, for example, you are unlikely to get it at 90. Scientists have debated this apparent decrease of cancer incidents in the elderly, some claiming that it is a statistical artifact caused by improper diagnosis and failure to report cases. This may have been true in earlier times, but is no longer valid in most of the U.S. In any event, cancer clearly doesn't *increase* after 80.

What does increase with years is failure in the two worst human weak spots, our arteries and our joints: our arteries, because disease in them eventually kills most of us; our joints, because disease there makes much of old age uncomfortable. If we can preserve and protect these two systems, there is no reason why we can't have as productive a life at 70, 80 and 90 as we can at 40.

It is important to note that it is our arteries, not our hearts, that cause most of what we call "heart disease." The heart itself, the muscular pump, is almost as reliable as our kidneys. There is some clearcut weakening of the heart's pumping ability in extreme old age, but all this means is that one can not set athletic records in one's 70s. The contractile force of the heart is adequate for walking, dancing and other moderate physical exercise well into its tenth decade.

It is the arteries that mess up our hearts, specifically the coronary arteries, which bring blood to the heart itself. The "aging" of many hearts is no more normal than is death by starvation in Bangladesh. The heart muscle is capable of beating normally, but, because of narrowed arteries, it is denied sufficient oxygen and nutrition. It is one of God's nastier tricks that, of all the arteries in the human body, those that supply the heart's own lifeblood are most susceptible to early narrowing. After all, who would worry very much if the dorsalis pedis artery to the foot had a tendency to get blocked off suddenly in men in their 40s? We might lose an occasional toe, but collateral circulation from other vessles would usually take over. At most, we'd have a lot of 50-year-old men with limps, instead of a lot of 50-year-old men dead.

The coronary arteries do clog up, however, and especially in men. The arteries in the brain clog up, causing strokes and, if enough of the small vessels go gradually, senility—the loss of intellectual power. "Senility" is not inevitable as we grow older. It is common, but it is not inevitable. The way to minimize it is the same as the way to minimize arteriosclerosis in other parts of the body.

The rules are fairly simple: Choose healthy parents. Don't smoke, stay thin, keep the amount of saturated fat in your diet to a minimum and get a lot of regular exercise. There is some dispute about each of these maxims, and if you want to find out whether they've been disproved or not, come back and bother me in 50 years. Right now the evidence is that each of these factors is terribly important, and, if you want to defy them, that's your business—but don't say you weren't warned.

There are some other interesting aspects to arteriosclerosis. It's made worse by high blood pressure, but no one knows—yet—if it's prevented by low blood pressure. There may be a point in lowering blood pressure even in "normal" individuals in an attempt to slow down a process (arteriosclerosis) that is much more common in mankind than in other

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species. Life insurance tables indicate that people with blood pressures on the low side of normal live longer than those with just plain "normal" blood pressure. There is, in fact, no sudden takeoff point in mortality rates as correlated with blood pressure—there is just a steady rise in mortality with each slight increase in blood pressure.

The implications of this are obvious. We have a number of one-a-day medicines that reduce blood pressure without significant side effects. Although it may be hard to justify giving medicine for many years to "normal" people to lower their blood pressure even more, some researcher, somewhere, is going to start doing this. May have already started it, for all I know. And it may work.

Another interesting aspect of arteriosclerosis involves the very first few steps as junk begins to pile up on the pristine, glistening intimal surface of your arteries. Pathologists disagree, but many feel that a crucial element in arteriosclerosis is the clumping together of platelets, little subcellular particles that float in the blood and are essential to plugging injured or cut blood vessels. The trouble with platelets is that they apparently clump on the inner surface of uninjured blood vessels, too, providing a rough spot around which more debris gets deposited. If one could stop the platelets from this unnecessary clumping and yet leave them normal enough so they can do the job when you cut yourself shaving, it's quite possible that the process of arteriosclerosis could be slowed down.

Aspirin makes platelets slippery. The National Institutes of Health is now conducting a study designed to see whether low-dose aspirin (three or so tablets daily) reduces the frequency of second heart attacks in patients who have already had their first. I'm not waiting for my first and I'm not waiting for the final results of the NIH study. If the stuff's no good, all I will have done is to have wasted some money. If the stuff does work, I don't want to waste five years before starting it.

It is one of God's nastier tricks that, of all the arteries in the human body, those that supply the heart's lifeblood are most susceptible to early narrowing

Fatness rules against longevity and contributes to the severity of arthritis. More significantly, extreme thinness is one of the few factors that clearly prolongs life in animals. One experiment that has been duplicated time and time again was first done in 1932 by Dr. Clive McKay at Cornell. By cutting down calories in rats' diets McKay prolonged their lives by up to a third. Whatever its mechanism, caloric restriction is the most effective life-prolonging method currently known—though its benefits in humans are only inferred, not proven.

Exercise is clearly a good thing for the heart and, probably, for the blood vessels. Much of what we consider to be decreased athletic performance due to aging is actually caused by lack of training. Studies in Sweden and at a naval research lab in San Diego indicate that if athletes remain highly conditioned, peak performance decreases by about 1 percent per year after age 25 or 30. If you can run a 4-minute mile at age 30, you should be able to do around 4:20 at age 40, which won't get you any gold medals but which will be better than 90 percent of high school milers. In a group of well-trained men between the ages of 45 and 55, who continued to exercise vigorously three times a week, researchers found no significant decline in stamina or physiologic aspects of fitness. Most of what we call growing old is lack of practice, and, while one may not be able to be a world-class athlete at 55, one should be able to ski all day or play three hard sets of singles.

The problem with much exercise is that it plays hell with one's knees and ankles, and the knees especially begin to show it as we get older. Degenerative arthritis—osteoarthritis, almost universal as humans age—is most bothersome in the big joints like the knees, and is clearly made worse by microtrauma over the preceding years. Each extra pound of weight, each shock transmitted up the fibula and tibia to the knee joint as we jog or play basketball with the kids may do its part in making us stiff-legged and aching when we're 70 or even 60. Washington orthopedist Stanford Lavine, a specialist in sports medicine, says, "Everyone comes out of pro basketball with bad knees—the cartilage is shot, the patella [kneecap] is shot." The damage that ten years of pro basketball can do is obvious. What is not yet so clear is the long-term effect of jogging on the knees and ankles. Stephen Haas, another orthopedist with a special interest in sports medicine, says, "The knees turn out to be the limiting factor in a lot of weekend athletes. The ankle joint is pretty stable, the heel can bother you on occasion, the lower vertebrae and the discs don't seem so obviously affected by athletics, but the knee is a naked joint and really gets it—and when an old person has bad knees, then his world changes a lot. You can get by with a bad shoulder, but mobility is part of your personality." Haas points out that failure to exercise puts old people at just as serious a risk. "You don't exercise, you put on weight. The more weight you put on the less you exercise, and the less you exercise, the weaker the supporting muscles and tendons become."

A great deal more research is needed on the effect of various kinds of athletic activity on the bones and joints. There is some evidence that one reason women are so susceptible to fracture of the femur in their 60s and 70s is the lack of exercise to stimulate new bone formation. It is also becoming evident that as individuals we vary in the strength and flexibility of our joints, and that we can undergo specific training to improve the vulnerable parts of our musculo-skeletal system. In old age we need flexible joints with adequate muscle tone to support them. While it's unlikely Alex Karras will achieve the suppleness of Olga Korbut, he would be helped if he achieved the maximum suppleness of Alex Karras.

There is in every aspect of aging significant promise from short-term medical research—research designed to overcome illness, rather than prolong life itself. The artificial hip joint is already a commonplace, and work is already begun on eventual knee prostheses. It is impossible to predict which transplant operations will change from curiosities to commonplace events in our lifetime, but I am willing to bet that some will. The initial publicity about heart transplants has subsided, but significant work is still being done. Initially derided by nonsurgical cardiologists (including me), the saphenous vein bypass operation for coronary artery disease has proved effective in relieving symptoms and will probably prove capable of prolonging life. Microsurgical techniques may make the operative treatment of strokes and cerebral arteriosclerosis a daily affair.

I would not, however, count upon the Great Transplant in the Sky or the discovery of a cell line that can multiply indefinitely. It makes much more sense to inventory the body you've been assigned, use it well, oil it regularly, protect it from evil and get some fun from it.

And watch out for your knees. ●

Healthy hair is everyone's crowning glory. But it won't happen overnight after one application of deep conditioner or one scalp massage. Healthy hair is a full time job and comes from within. That's why it is so important that your hair gets the proper nutrition. As a matter of fact, hair has very special nutritional needs since it grows seven times faster than body cells. So, general nutrition is just not sufficient in sustaining the continued growth of a healthy scalp.

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LASERS: THE LIGHT AT THE END OF THE TUNNEL?

By George A.W. Boehm

"Smoking is not permitted in the auditorium," says an announcer, "and that includes cigarettes." The lights go down and the eerie strains of Emerson, Lake and Palmer come up, filling the crowded planetarium. And then . . .

Laserium! For the next hour, a one-watt laser beam explodes into a mind-bending cosmic light show on the domed ceiling. The dazzled audience has never seen anything like it.

This and similar scenes are being played out several nights a week at the 15 major U.S. planetariums where *Laserium* is packing them in. The youngish audiences invariably are wowed by the laser's act, but it is child's play; they ain't seen *nothin'* yet.

For over the past 15 years, the fabled laser has come out of its sci-fi closet, every bit as fantastic as anything Ray Bradbury ever imagined. No more an unreliable laboratory curiosity, today it stands on the brink of technological leaps that will change our lives and our planet.

Whether cutting through two inches of the toughest steel in seconds, or repairing broken blood vessels in a human eye, laser usage is already a grab bag of miracles. And more are on the way. "Excellent ideas for lasers are a dime a dozen," says Ali Javan of MIT, one of the founding fathers of laser technology. "What we most need now are trained people dedicated to inventing and perfecting things that work."

Just such people are on the way. The laser field is so hot, its opportunities for originality so great, that today it is attracting many of the country's best young scientists and engineers. (Older scientists are anxious to get in on the act too. One eminent MIT graduate recently has been showing colleagues his drawings for a laser pistol designed to shoot down mosquitoes on the wing.) For most Americans, as for much of the developed world, the laser's impact on contemporary life will first become evident in communications. Within a matter of years, our entire system of communicating sounds, pictures and information is likely to be expanded a thousandfold or more, as messages increasingly are transmitted by laser light instead of electricity or radio waves.

Since last winter, Bell Labs and Western Electric, the telephone company's research and manufacturing arms, have been testing a new way to send messages. Generated by microscopically small, transistorlike lasers, the data travel over glass fibers thinner than human hairs. One laser is cemented to the tip of each fiber. The lasers flash on and off some 45 million times a second, spelling out a code like that used for blinker lights between ships at sea. Two of these fibers have enough capacity to transmit a color television program. A sheaf of 100, no thicker than a pencil, can send the entire contents of 200 books in just one second.

There are several advantages to transmitting light pulses through glass instead of radio signals through copper cable. In very large cables, signals fade so rapidly that they must be re-formed and amplified by a "repeater" almost once

PHOTOGRAPH BY FRITZ GORO

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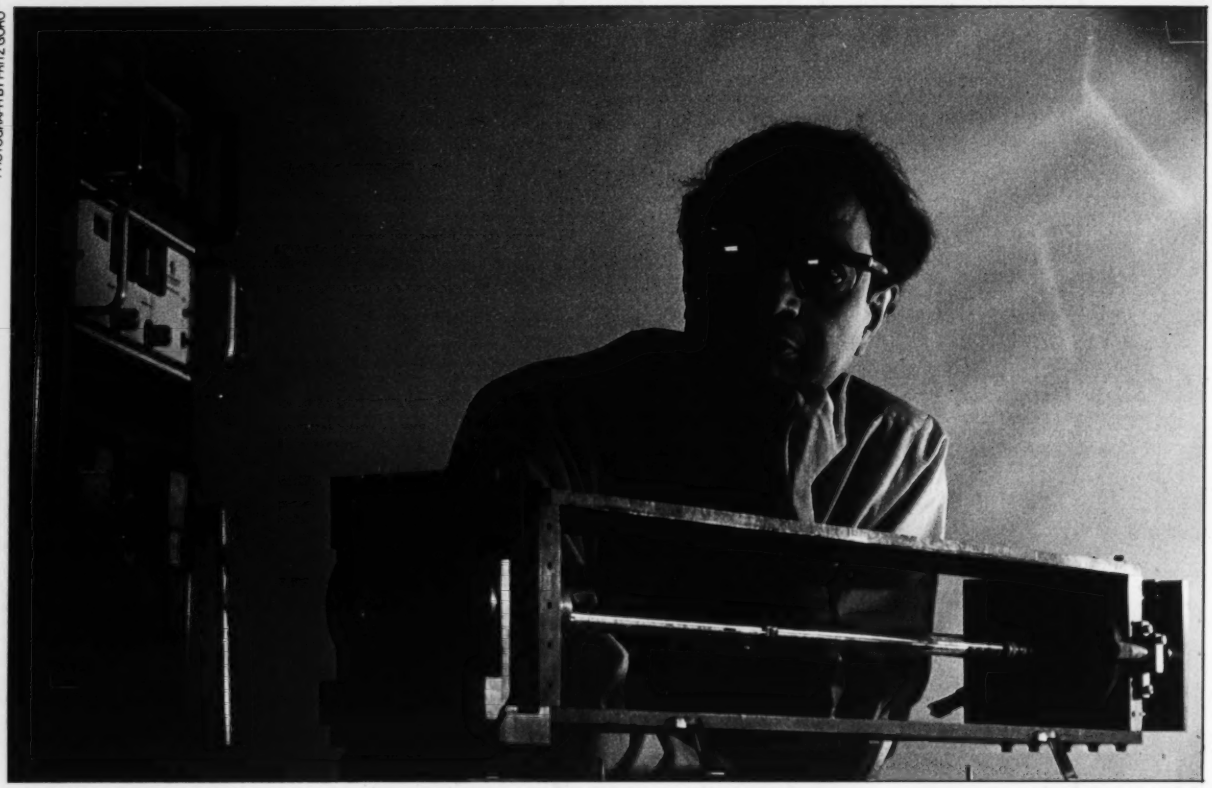

Ali Javan stands with a model of an early laser, which he invented. Using parallel mirrors, the laser reflects light back and forth, creating a beam of a single wavelength. Laser is an acronym for Light Amplification by Stimulated Emission of Radiation. Because a laser beam consists of parallel light waves of the same energy, it is more focused and more powerful than ordinary, incoherent light.

a mile; even larger cables would require more closely spaced repeaters. But with the lasers' glass-fiber sheafs, the expensive repeaters at first will be needed only at five-mile intervals, and soon may be eliminated entirely for short hauls up to 50 miles. And, unlike copper, the basic raw material for the glass fibers—beach sand—is virtually inexhaustible.

These compact laser carriers will be a boon to most cities, which already are so jammed underground with power cables, water and sewage pipes, and steam and electric ducts that there is no room left to install needed but bulky telephone cables. Looking further ahead, engineers envision laser-based communications breakthroughs that are physically impossible or prohibitively expensive with today's cable and microwave equipment. Large businesses that now ship hundreds of tons of papers daily will be able to send the same information more simply, cheaply and quickly by laser; the only new piece of equipment necessary will be a facsimile machine, faster and less expensive than those in use today.

In time, private homes will have their own fiber systems, each carrying laser pulses into which are coded telephone and television signals, even personal letters. The first commercial use of lasers to carry TV signals began in New York last summer, and affordable three-dimensional television is on the horizon, feasible in part because lasers' optical wavelengths can carry thousands of times as much information as microwaves. As versatile laser receivers become common, more and more information, from business files to entire libraries, will be stored on microfilm and microfiche, any of it retrievable by a process only slightly more difficult than dialing a phone number. And John R. Pierce of Caltech (the first to predict satellite communication) foresees the day when many Americans will "communicate to work" instead of commuting.

As lasers begin to revolutionize paper work, they simultaneously are effecting dramatic changes in heavy industry. In many plants, high-power lasers have already begun to replace various machine tools and furnaces. Outside of Boston, Avco Everett Research Laboratory is marketing a line of metalworking lasers of up to 20 kilowatts, lasers that can cut through metal blocks or bevel surfaces tucked away in otherwise inaccessible spots.

Laser welding is especially effective because the sharply focused beam concentrates its heat in the weld zone, minimizing distortion. Often a laser can "slither" between two pieces of metal to be joined even though the gap may be only a thousandth of an inch. Similarly, case hardening is much more discriminating when done by laser than by heating the metal in a furnace; the areas to be hardened absorb almost all the concentrated heat of the laser, leaving adjoining areas strong and ductile.

At the start of the Industrial Revolution, a single rotating shaft often stretched the length of individual factories, and power was siphoned off with belts, pulleys and gears. Similarly, future plants may require only a single laser, whose beam will be diverted by mirrors to wherever needed.

George A.W. Boehm is a free-lance writer, mathematician and consultant living in New York.

Although industrial lasers emit enough power to burn an arm or leg to cinder in seconds, not a single accident has ever been attributed to a laser. High-powered beams are usually enclosed in a plastic housing linked to a complex interlock system; if the beam strays, the plastic catches fire, shutting off the power instantly. Generally such precautions are unnecessary however, since most lasers are low-powered and will injure only someone staring directly into a beam. These low-powered lasers can repair structures as delicate as integrated circuits or the interior of the human eye. They are helping biologists distinguish certain kinds of cancerous cells; cervical cancer can be detected, for example, by passing a stream of cells from a Pap smear through a glass tube, which is then scanned by a laser. (With a laser, the cells need not be killed or stained as they are with conventional microscopic examinations.) And in growing numbers of U.S. supermarkets, low-powered lasers now "read" and interpret the closely spaced black lines appearing on many packages, transmit the information to a computer and print out an itemized bill for the shopper.

The "holographic" laser is another low-powered beam, one that some scientists believe will prove the greatest innovation in image formation since the invention of photography. Holograms—three-dimensional pictures projected onto flat photographic plates—have been around in rudimentary form since 1948. But it was only with the advent of lasers that the full potential of holography became apparent. Laser-produced holograms were much sharper than the earlier ones dependent on mercury arcs, which do not emit the completely regular light waves characteristic of lasers; better still, laser holography could be produced in color.

Today, holography is helping to overcome the negligible depth of field that has always been the major drawback of standard microscopes. But the expense of making and displaying holograms continues to delay the development of holography as a major art form. Those who could most easily foot the bills—corporate advertisers—are waiting for a method of economical laser transmission so that holograms can be shown on television; with continuing advancements in fiber optics, this should be possible soon. Cartier's in New York already has successfully used an attention-grabbing holographic window display, a ringed hand seeming to reach out onto Fifth Avenue.

Artists, meanwhile, are experimenting with laser holography: one has arranged several holograms on a hollow cylinder, around which viewers walk. The effect is so enlightening that several lovers of the arts have paid up to $100 for a ticket entitling them to a ten-minute stroll through this 3-D wonderland of hard-core porn.

But none of the changes that the laser is bringing to science, industry and the arts can match its potential for easing the world's energy squeeze. The brightest hope today for clean, cheap, unlimited power depends on harnessing lasers to fuse hydrogen atoms.

For more than 20 years, physicists have been trying to tap the energy output of fused isotopes of hydrogen. The path that has been laboriously followed has been to confine a plasma of ionized gas particles and try to heat them gradually to a temperature at which they will fuse. But something has always gone wrong; usually the heating plasma has escaped from its confining magnetic field.

But today's lasers can release an incredible burst of power in a billionth of a second; the peak power during that instant is 20 trillion watts, or 25 times as much energy as that produced by all the power plants in the U.S. at any one time. With such enormous bursts of energy, scientists envision

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Best Of Leon

PHOTOGRAPH BY STEVE L. BORNS © 1975

The art of holography takes photography one dimension further. Selwyn Lissak is looking at a hologram—a three-dimensional image constructed of light— that he made of jazz trumpeter Sam Rivers.

bombarding frozen pellets of hydrogen isotopes, causing them to gasify into a plasma that will fuse before it has time to escape. Preliminary laboratory experiments using this approach have been promising if inconclusive, but some experts believe success is no more than five years off.

Hydrogen fusion which produces much more power than it consumes would probably free the entire world from worries about energy shortages for as long as the human race exists. But meanwhile, science is not ignoring the possibility of cleaner, more efficient power from fission of the heaviest elements. Here again, lasers would play a key role, for the most efficient way of separating heavy isotopes is believed to be through laser bombardment. Some of the energy from laser fission could be used to "breed" still more fissionable material. Some could drive turbines to generate electric power. The rest, concentrated to a superhot level, could be used to split water and create the kind of "portable" energy that society requires—hydrogen, gasoline and other combustible materials that can be shipped in relatively small quantities to be burned in remote places or to fuel automobiles and airplanes.

The problem of storing nuclear wastes—one of the most worrisome in the fission-power program—can also be alleviated by using lasers to separate isotopes. Nowadays vast quantities of "hot" materials have to be stored for hundreds or thousands of years in abandoned salt mines or concrete blocks on the ocean floor. Yet there actually are only a few extremely dangerous isotopes. If they are sorted out with laser separation techniques already perfected, they can be stored more safely and cheaply in relatively small, specially constructed containers.

Pollution is another global problem that lasers are helping to tackle. Laser sensors mounted on airplanes rapidly scan the ground or water below, and from the reflected light, analytic devices then measure pollutants with a speed and accuracy never before possible. Similar setups promise to reveal ore veins deep under the earth. Most ores emit characteristic gases that escape into the air: although the quantities are minute, a rapid scan by a laser, mounted in an airplane or satellite and tuned to the relevant gases, will be able to detect far smaller quantities than can be measured by any earthbound apparatus.

Lasers have also proved to be almost ideal measuring rods beyond the earth's atmosphere. No dust, fog or other impurities interfere with the flow of light. The coherence that is peculiarly characteristic of laser beams keeps them sharply focused over distances of hundreds of thousands of miles. The four reflectors that astronauts placed on the moon are still being used as laser targets to detect eccentricities in the motion of the moon as well as in the shape and behavior of Earth.

As future landings are made on Mars and other planets, laser instruments will provide much more detailed information than pictures telemetered back to Earth. Some of the rockets of the future probably will be launched by high-power lasers on mountain tops. The heat of the beam will vaporize a simple propellant—perhaps even water. The tons of weight thus saved can be allocated to such heavy payloads as telescopes or construction materials for solar power plants in space.

Even as it helps explore other worlds, the laser is beginning to probe the mystery of life on Earth. Lasers can now be tuned to emit any wavelength of light, from the far infrared to the ultraviolet, meaning that lasers can initiate chemical reactions that would otherwise be impossible to induce. With some such wavelengths, biologists are now able to probe the submicroscopic structures of the molecules that monitor all life.

Within a few years, it will be practical to explore in detail the materials that govern both genetics and the antibodies that combat disease. It may even prove possible to modify these giant molecules with precise and gentle bursts of laser light. The consequences of such tinkering are impossible to foresee. It could open new avenues toward the conquest of most diseases, whether genetic or contracted. Or, recklessly or ruthlessly applied, it could lead to a biologic nightmare.

With all its fantastic power and precision, the laser naturally intrigues the world's military establishment. The U.S. Defense Department—publicly at least—pooh-poohs the kinds of laser ray guns that planetary armies have been zapping each other with for years in the pages of science fiction; conventional antipersonnel weapons, says Defense, are cheaper, easier to handle and much more efficient.

Art lovers have paid $100 a ticket for a ten-minute stroll through a 3-D holographic wonderland of hard-core porn

For one kind of battle problem, however, the laser stands out as an ideal solution. Missiles designed to attack planes, ships and ground installations are capable of extremely fast evasive action. Heavy guns have too much inertia to track them or keep them in their sights; but a high-power laser beam can be swung rapidly enough to follow and destroy the normally thin-skinned missiles.

In case you think you can relax for a few decades while attack lasers are developed, forget it. *Newsweek* recently reported that a U.S. early-warning satellite and a companion satellite to relay signals to Earth were hit by a Soviet laser over the Indian Ocean within the past year. The early-warning craft was knocked out of commission; the relay satellite was destroyed.

Welcome to the wonderful world of lasers. It's later than you think. ●

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There are cigarettes and there are cigarettes. And if you're a smoker you certainly know by now which brand you really enjoy smoking.

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Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

FILTER: 11 mg. "tar", 0.7 mg. nicotine, MENTHOL: 11 mg. "tar", 0.8 mg. nicotine, av. per cigarette, FTC Report APR. '76.

Why can't a woman be more like a man...and vice versa?

ANDROGYNY

By Andrew Kopkind

You see them in shopping malls and Manhattan boutiques, in locker rooms and ladies' lounges, in school rooms, factories, kitchens, bedrooms, on television and in the movies. They wear pants suits and leisure suits, jeans and caftans, blow-dry haircuts, herbal perfumes; they are rock singers who twirl their hips, coeds who dig the Alaskan pipeline, a football tackle who crochets, a Brownie in the Little League, a President-elect who broadcasts love and compassion and weeps at the news of his election. They practice the many ways of androgyny, but they rarely recognize its profound novelty. They are—we are—skirting the edge of a revolution in sexual consciousness so radical that it could make the disruptions of the last decade seem like tantrums in a sandbox.

Androgyny—literally, man-woman—is as old as prehistoric myth and as new as next fall's fashions. It is as banal as unisex hairdos and as basic as human equality, as pop as David Bowie and as cultivated as Virginia Woolf. It stretches from Bloomsbury to Bloomingdale's. Its expressions are the many mixtures of manners, styles and values assigned by custom—or law—to only one or the other sex: dominance, breadwinning, decisiveness to males; dependence, child rearing, tenderness to females. Convention calls it a sin, or a joke, to reassign those roles; both comedy and religion contain plenty of cautionary tales on the subject. But androgyny implies not a mere exchange or reversal of the roles, but liberation from them, the removal of the stereotypes of sex, an escape from the jailhouse of gender.

"Behavior should have no gender," Stanford psychologist Sandra Bem insists. What people do for a living, what they wear, how they express themselves or how they confront the everyday world has nothing to do with their sex types. That, at least, is the androgynous ideal. If true androgynes evolve from this heavily stereotyped society, they will be tender and dominant, dependent and decisive, ambitious and nurturing according to their human temperament, not their gender.

But for most people, the reality of manners and morals in our sex-polarized civilization is so far from that ideal plane that it is hard to see how it will be reached, what is pushing us there—and why it should be an ideal in the first place.

Simply to sense the androgynous current that runs beneath the surface of ordinary events is difficult enough. The heads that bob up seem only tenuously connected: Mick Jagger, Patti Smith, Twyla Tharp, Lauren Hutton, Cary Grant; tuxedoed women in *Vogue*; families that share a hair dryer in TV commercials; middle-aged couples in matching acrylic leisure/pants suits; fathers minding the kids while mothers go to the office. They all partake of an androgynous sensibility that was almost unknown a generation ago. Some people *look* androgynous: they incorporate masculine and feminine body characteristics and mannerisms in a hybrid whole. Others *behave* androgynously: they work, play or act in ways not completely "appropriate" to their gender. And still others *feel* androgynous: their emotions do not correspond to the list of acceptable passions assigned to their sex.

There is no uniform scale yet in use that measures the development of an androgynous personality (although Sandra Bem is working on the problem: she believes healthy sexual adjustment should be plotted against androgynous perfection, not masculine/feminine polarity). Nor is there a way to chart

SCULPTURE BY CAROLE JEAN

the movement toward androgyny in the society at large. But almost everyone has impressions that something peculiar is happening to sex roles. By and large, role changing is still a joke or a sin. But one morning, not too far in the future, the critical mass of Americans may wake up and realize that androgyny is on its way—and all hell will break loose.

The trend began decades ago, but between the death of Victoria and the dawn of Aquarius androgyny was confined to hothouse environments of intellectuals, actors, musicians and other freaks. It hardly moved out of Bloomsbury, Greenwich Village or the Hollywood Hills.

Then the marshaled forces of the sexual revolution in the late 1960s propelled androgyny out of its bohemian closets and into Middle American family rooms. The bottom line of feminism and gay liberation has been the obliteration of socially defined roles. Women no longer have to look, act or feel the way men's fantasies dictate. Homosexuals can be free of the emotional straitjackets tailored by heterosexual demands. In back of those battlelines, others removed from the struggles have the opportunity—and the impetus—to summon up those parts of themselves that were always restrained by propriety.

In the beginning the muse of androgyny created denim, unstyled and impersonal, then washed, crushed, crimped and flared—but preeminently the unisex texture. Soon men and women were sharing work boots, hiking boots, Frye boots, clogs, Adidas sneakers, Earth Shoes; jogging suits, snowmobile suits, jumpsuits, silk shirts, beads and bracelets, pendants and necklaces, turquoise rings, perfumes.

"Men's scents used to be a joke," Annette Green of New York's Fragrance Foundation reports. "Hai Karate advertised with grunts. And then Aramis came along and it took the male perfume market seriously." And no wonder. American men last year spent $208 million on cologne, an increase of 18 percent over the previous year. According to *Beauty Fashion* magazine, "the sound barrier of masculinity has been smashed and the blue-collar worker does not consider it 'faggish' to use the heavier colognes."

The androgynous sensibility invaded high fashion: Gernreich and Courreges added a dimension of spacey, sexy masculinity to feminine frills. Cardin began tailoring men's clothes to emphasize sleek figures and forms. Men and women could now wear their new suits with the same style of turtleneck sweater—and a piece of jewelry if they chose. The Marlboro dude became the Winston androgyne, showing off his gold good-luck charm hanging deep in his cleavage, his blow-dry hair immobile in strong wind or calm.

The imported flotsam and jetsam of the Third World made its way from hippie head shops and college-town bazaars to fashionable unisex boutiques. Most of it was well-suited for androgynous wear: who knew whether maharajas or maharanis wore a particular style of shirt or piece of jewelry; who cared whether a camel driver or his wife fancied sheepskin jackets. At home any sex could play the import game.

Better than the Third World as a spring of unisex styles was Outer Space. If sex-typed fashions could be altered on the road from Morocco, they were ready-to-wear from Krypton. Androgyny is a prevailing theme in futurist and otherworldly literature: men and women in sci-fi movies set centuries ahead in time are often identically clothed, ornamented—and conveniently bald, whether because of evolution or advanced barbering. Space is the great sex leveler. Technology and convenience, at least, demand that Soviet male and female cosmonauts wear unisex clothing, perform the same tasks and treat each other as equals. It might somehow be awkward for a cosmonaut man to hold the space hatch open for a cosmonaut woman on their way down the stairs to a new planet.

PHOTOGRAPH BY STEVE LANDIS

Rock and roll poet Patti Smith: escaping from the jailhouse of gender

Space and science fiction allow a different kind of escape from mundane sex roles. Two of the most androgynous rock stars—David Bowie and Elton John—have futurist personae: Bowie has been, on different occasions, Ziggy Stardust (a man from Mars) and the Man Who Fell to Earth. John plays as Captain Fantastic and sings in "Rocket Man," one of his early hits, "I'm not the man they think I am at home/Oh! no, no, no/I'm a rocket man." And the most twisted androgynous fantasy of all is Alice Cooper, who transcends sex roles altogether with the force of corruption and mockery.

The politics of pure androgyny has always had significant historical support, while under social attack. Philosophers and psychologists have maintained that each human has "masculine" and "feminine" characteristics, but society channels individuals into that category in which behavior matches sexual appearance. The other half—the unused complement of traits—is then lost, forgotten or repressed, often with dire results for the person's psyche or soul.

Aristophanes, Plato's character in *The Symposium*, formulated the famous allegory of three original sexes—male,

female and hermaphrodite—split into halves by Zeus; each half has spent the succeeding aeons searching for its mate to regain completion (as homosexual man, lesbian female and heterosexual). Hinduism, Buddhism and Zoroastrianism all contain visions of Creation that postulate androgynous beings cleaved into single, incomplete sexes. Freud and Jung saw evidence of continuing conflict between masculine and feminine instincts, or unconscious memories in the individual. Contemporary psychotherapists often encourage patients to awaken their submerged "other" selves to achieve healthy wholeness. In therapy, if not in life, men are supposed to cry and solicit affection, women are helped to express anger and assert their independence. D.H. Lawrence—by turns an egregious male chauvinist and prophet of androgyny—saw in "The Rainbow" the evolution of a feminine principle that would renew the world spoiled by men. Proust, Artaud, Cocteau, Apollinaire—there is a hidden literary history of androgyny that only now can be understood in a social context.

But the doctors—of the church, of philosophy, of medicine and literature—have not always been helpful. They customarily confuse androgynous behavior with sexual preference or with gender identity. Their confusion has become common fallacy, so that many people mistake androgyny for bisexuality or homosexuality or neuter sexuality—or with hermaphroditism or transsexuality. It is none of the above. Androgyny is the principle that *unties* gender and sexual orientation from human activity. Androgynous people can be male or female, heterosexual or homosexual. They can be as sexually hot as Jagger or Dietrich or as cool as Bowie or Audrey Hepburn. They move toward an existence in which those aspects of sexuality do not confine their behavior.

As for sexual preference, Sandra Bem argues that it is utterly irrelevant "to anything other than the individual's own love or pleasure," and should be ignored as a social fact, no more or less interesting than the color of one's eyes or the length of fingernails. Roles of emotion or behavior based on sex, she continues, are not only absurd but destructive of human health and happiness; to be poured into a masculine or feminine mold makes both men and women unable to cope with the complexities of life.

In a series of devilishly clever experiments, in which subjects chose simple tasks or performed certain actions, Bem saw that the most highly "polarized" men and women neither enjoyed themselves nor performed effectively. In one test, in which subjects were supposed to interact with a tiny kitten, the "super-feminine" women could not deal with the nurturing task, while the more androgynous women handled the situation best. Bem and her colleagues have a long way to go to flesh out their pioneering studies. But they seem to have discovered that traditional sex roles constrict both men and women and impair their power to fulfill themselves in work and play.

But if orientation and roles are irrelevant and absurd, gender clearly is not. "Even if people were all to become psychologically androgynous, the world would continue to consist of two sexes, male and female would continue to be one of the first and most basic dichotomies that young children would learn and no one would grow up ignorant of or even indifferent to his or her gender," Bem writes. The point is that even gender has limited relevance: it does not demand inevitable roles. Women can be comfortable with their female bodies, but they do not have to bear or raise children—unless they want to. Men can be secure in their masculine physiques, but they do not have to chase girls, play basketball, father families or join the career rat race—unless it pleases them to do so. Such decisions can be left to individual personality and inclination.

PHOTOGRAPH BY CENTRAL PRESS/PICTORIAL PARADE

Mick and Bianca Jagger: Androgyny is flowering in the educated middle class and the radical counterculture.

BRIGHTEN UP YOUR HOLIDAYS WITH MYERS'S DARK RUM.

Myers's Rum And...

Fill a tall glass with ice, add 1½ oz. Myers's Rum, top with cola, or... tonic...bitter lemon, plus a slice of lemon or lime.

Myers's dark rum will bring a special light and sparkle to all your holiday festivities. Because Myers's is rich, deep Jamaican rum. Made slowly, in small batches, Myers's is blended specially to be more flavorful. Myers's will add extra punch to your punch. A special sizzle to a rum swizzle. And a delicious dash to your cakes and desserts. So if you like the taste of rum, serve the rum you can taste. Light up your holidays with Myers's dark rum.

Myers's Rum Punch.

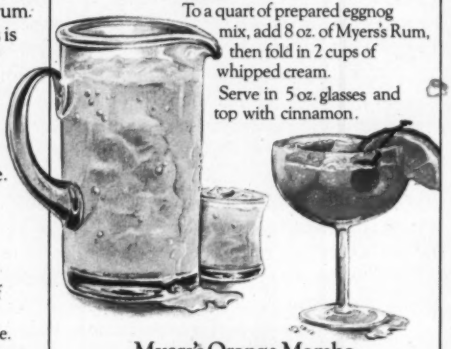
Serves 15-20

Into a large punch bowl place: 1½ fifths of Myers's Rum, 6 oz. pineapple juice, 10 oz. orange juice, 10 oz. lemon or lime juice. Let mixture steep for 1 hour. Before serving, add 1½ quarts of ginger ale or club soda and decorate with lemon or lime slices and strawberries. Place a cake of ice or several trays of cubes in the punch and serve.

Myers's Jamaican Eggnog.

Serves 8

To a quart of prepared eggnog mix, add 8 oz. of Myers's Rum, then fold in 2 cups of whipped cream. Serve in 5 oz. glasses and top with cinnamon.



Myers's Orange Mambo.

A punch-type drink that easily serves 5 people.

Stir into a pitcher of ice cubes:
1—6 oz. can concentrated frozen orange juice
2—6 oz. cans of water (use the juice can)
6 oz. of Myers's Rum.

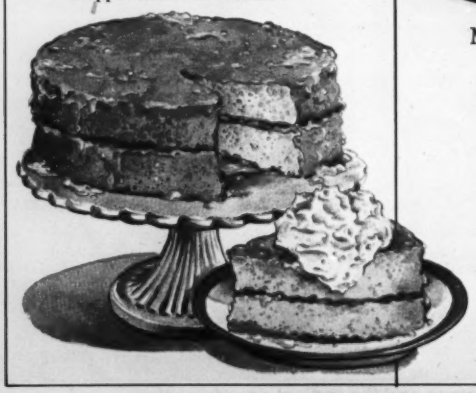
Myers's Baba au Rhum.

Serves 6 to 8

Build two layers of store-bought sponge cakes and top it with this sauce: Combine ½ cup water and ½ cup sugar, boil and cook for 1 minute. Add ½ cup Myers's Rum. Pour ⅔ of the mixture over the cake immediately. Let soak in.

To remaining sauce, stir in until dissolved, 2 tblsps. apple or quince jelly.

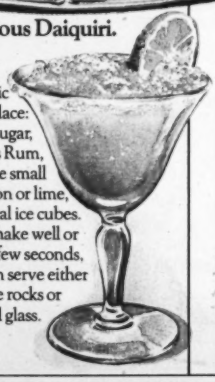
Before serving, pour the remaining sauce over cake and serve with a dollop of whipped cream over each slice.



Myers's Delicious Daiquiri.

Serves 1

Into a cocktail shaker or electric blender, place: 1 tsp. sugar, 1½ oz. Myers's Rum, juice of one small lemon or lime, several ice cubes. Shake well or blend for a few seconds, then serve either over the rocks or in a cocktail glass.



For a free recipe booklet write: Seagram Distillers Co., 375 Park Avenue, New York, N.Y. 10022. 80 Proof.

Finally, it does not really matter whether traits of temperament are inherited or acquired, or even if they are in some ways attached to gender. Perhaps there are evolved "feminine" or "masculine" qualities—or perhaps they are arbitrarily assigned, like "masculine" and "feminine" rhymes, or "male" and "female" plugs and sockets. Not to worry: one follows or ignores the logic of one's instincts or wishes—not what social convention determines them to require. "Androgyny," Columbia Professor Carolyn Heilbrun writes, "seeks to liberate the individual from the confines of the appropriate."

Definitions are necessary and distinctions are required precisely because androgyny is so ill-considered in our culture. We cannot describe it in our "dead language," as Adrienne Rich says scornfully, because our concepts and the words that signify them are tied to sex-role stereotypes. An aboriginal Eskimo who never left the North Pole could describe a world without snow only in terms of snow. We sexual aborigines can describe a world without sex roles only in terms of sex roles.

Alexandra Kaplan and Joan Bean, whose compilation of recent research papers on androgyny (*Beyond Sex-Role Stereotypes*) marks the beginning of a new approach to sexual psychology, contend that androgynous people have always existed, but until now they have been "invisible" to social scientists—and almost everyone else except the odd poet or the chroniclers of the bizarre. So there is no readily available vocabulary to describe the "hybrid" androgynous qualities that are being born: the trait between dominance and dependence, synthesizing tender and competitive, or combining assertive and nurturing.

If a man steps out of his assigned roles he is denigrated as a "sissy." If a woman oversteps hers, she is chastised as "mannish." More than most men, who have the power to set the language as well as the rules of social games, women and homosexuals have always known the perils of exceeding propriety. Even after a decade of women's liberation, females who dress, behave or work in previously "masculine" territory are conspicuous, isolated and subtly or blatantly condemned (often with patronizing praise). In the same way, gay men who inhabit the "feminine" category of man-loving are pushed into grotesque expressions of all the other qualities in that sex role: they are called "queens" and they act out that assigned part with mincing manners, campy styles and drag. If society says that a woman in a "man's job" is mannish, she will act that way; if it says gays are "sissies," they will ultimately act out their own parodies.

Not only homosexuals are deformed by such typecasting. Men of whatever sexual orientation who exhibit tenderness or shyness, or who easily express their feelings, are usually treated with contempt or condescension. One of the saddest examples of the genre was Adlai Stevenson, whose sensitive, slightly vulnerable wit was widely deprecated in Washington as evidence of his lack of guts, vigor, clout—in short, "balls." Lyndon Johnson despised him for it: "Why, he has to sit down to pee," Johnson once said of Stevenson. So much for the popularity of androgynous qualities.

Senator Muskie's well-known outburst of emotion in New Hampshire during his 1972 presidential primary campaign probably cost him the Democratic nomination. And this year, Jimmy Carter's lack of "decisiveness," his rhetoric of "compassion" and his soft-spoken manners surely diminished his popularity in those constituencies least responsive to those slightly androgynous qualities. Not for nothing did Carter slip in the polls as his personality became more familiar. Americans expect their presidents to be high up on the index of masculinity (self-reliant, defends own beliefs, independent, assertive, strong personality, competitive, individualistic, etc.) and nowhere near the items on the femininity list (yielding, shy, gullible, soft-spoken, compassionate, childlike, eager to soothe hurt feelings, etc.).

Early in the primaries a particularly astute though unliberated aunt of a friend of mine saw Carter on television and decided some "presidential" dimension of masculinity was missing. "*Faigele!*" she pronounced in her Bronx Yiddish idiom—"Fairy!"—and walked away from the TV. Her idiom had no other word for what she saw.

Carter is hardly a sexual ideologue's vision of an androgyne, nor did Muskie or Stevenson come close to that idea. Beneath their thinnish skins beat macho hearts. But it's obvious that, more than many political leaders, they moved slightly centerward from the polar masculine stereotype. Kennedy spoke of vigor and strength, Carter conveyed compassion and love. No matter how real or disingenuous either candidate's rhetoric may have been, the identity they projected was strikingly different. One writer on sexual topics recently mused that Carter's victory was an important sign of a changing national consciousness, and that perhaps an androgyne could someday be president of the United States.

The President-elect is presumably no *faigele*, despite Aunt Frieda's suspicions, nor are most of the men who are beginning to acquire androgynous manners. But a sex-stereotyped society can imagine no other category for androg-

Androgynous people can be male or female, heterosexual or homosexual. They can be as sexually hot as Jagger or Dietrich or as cool as Bowie or Audrey Hepburn

ynous men except a sexual one. Similarly, most of the women who wear "man's style" clothes, sport unisex tastes and invade masculine precincts of work or study are not lesbians. Yet custom gives androgynous women pejorative labels and locks them in a sexual role. Even an acquisition of high fashion does not always help: the classiest models are called "Vogue dykes," an epithet that manages to combine the joke and the sin of androgyny. The most glaring irony of all is that in a more androgynous world it would not be necessary, or even intelligent, to make any distinctions or disclaimers of sexual orientation in relation to behavior.

But in the sex-typed world there is clearly a connection between homosexual and feminist *culture* and androgynous *styles*. Gays in large measure make up the androgynous vanguard; feminists are both theoreticians and practitioners of androgyny. Sexual outcasts (it makes no difference whether self or society does the casting) are able to invent new roles because they are not allowed to maintain the old ones. Self-reliant, assertive women have to develop their own feminist culture: the dominant society will not let them back into the world of wallflowers and housewives on their own terms. Gay men who have been consigned to the "sissy" world of emotional self-consciousness cannot travel back to the land of passionless masculinity and cold rationality. But their new makeshift culture contains the available models for later androgynous styles.

The preeminent example of an androgynous community in the early years of the century, way before the recent lib-

eration movements were born, was the Bloomsbury set, the informal but internally cohesive group of English writers, critics, artists and floating intellectuals who hung on in a slightly unfashionable section of London during and after the First World War. At its center was Virginia Woolf, her husband Leonard, sister Vanessa Bell and brother-in-law Clive Bell, the biographer Lytton Strachey, the economist John Maynard Keynes and the critic Roger Fry. On the periphery, but very much revered, was the novelist E.M. Forster.

The artistic and intellectual output of Bloomsbury was prodigious. But, most of all, it was a unique model of a civilized community based on equality. The members recognized the basis of their civilization: "The equality of the sexes, the outer manifestation of the equality of the masculine and feminine impulses, are essential to civilization," Carolyn Heilbrun writes of Bloomsbury in her trenchant study *Toward a Recognition of Androgyny*. Virginia Woolf was convinced that she and her world were approaching androgyny, although she feared that the ideal would explode as it neared reality; perfection and completion could not exist in imperfect, fragmented surroundings. She saw a signal of androgyny in a single, silent falling leaf, "pointing to a force in things which one has overlooked."

"I don't know what's happening to men these days," says Sylvester Stallone. "In discos, men and women look almost alike, and if you were a little bleary-eyed, you'd get them mixed up"

Many of the Bloomsbury setters were homosexual or bisexual, and the byways of "inappropriate" sexuality were always very much in their hearts and minds. There were famous romantic triangles and quadrangles, scandalous ruptures of ceremony, hilarious practical jokes. Lytton Strachey appeared before the tribunal trying him for conscientious objection to military service wearing earrings, shoulder-length hair, an outlandish robe, and carrying an air pillow, which he blew up before the judges. He said it was necessary for his hemorrhoids. When asked what action he would take if a German soldier attempted to rape his sister, he replied impishly, "I should try to interpose my body." The Bloomsbury biographer, David Gadd, calls Strachey's response "a memorable reply whose monstrous ambiguity was fully appreciated by Lytton's three sisters," who were in the courtroom. But despite the famous japes, a premium was placed on the conquest of the vices of the old social order: jealousy, competitiveness, vindictiveness. Because of the sexual orientation of many in the group, its self-proclaimed androgyny has always been confused with the preferences of the members. But the truth of the situation was the other way around: the members' extraordinary sexual orientation gave them both perspective and motivation to explore innovative, androgynous relationships.

Bloomsbury gives historic context and some intellectual nuances to the new androgyny, but not much more. When you look for androgyny today you are apt to find it in much less transcendantal places. Former Los Angeles Ram Rosey Greer crochets his own pretty things and sings a pop song, "It's All Right to Cry," but he owes little of his sensibility to Lytton Strachey. It is seen in fleeting glimpses: Minnesota Viking Fran Tarkenton sending a touchdown pass to teammate Sammy White, and the two of them celebrating the event by holding hands as they walk back down the field—not in the old back-slapping jock gesture but in a manner that two schoolgirls would have used.

On the screen it is the androgynous Fred Astaire in *That's Entertainment, II*, soft-shoeing alongside the heavily masculine Gene Kelly—still charming and still macho after all these years. Or Garbo, Dietrich or Katherine Hepburn, in almost any of their old roles—but especially opposite leading men with an androgynous bent: Grant, for example, not Gable.

In fact, there's so much androgynous manhood around that some new Hollywood stars are making a buck on the backlash. Sylvester Stallone, writer and hero of *Rocky*, told the *New York Times*' Judy Klemesrud, "I don't think that even Women's Lib wants all men to become limp-wristed librarians. I don't know what's happening to men these days. There's a trend towards a sleek, subdued sophistication and a lack of participation in sports. In discos, men and women look almost alike, and if you were a little bleary-eyed, you'd get them mixed up. I think it's wrong . . . . There doesn't seem to be enough real men to go around."

Bloomsbury had indicated that in its origins androgyny would flower in the upper registers of social class and intellect, and that it would be carried along on a politically progres-

PHOTOGRAPH BY ALAN LEWIS KLEINBERG/NEW YORK TIMES

Androgyny invades high fashion: adding a dimension of spacey, sexy masculinity to feminine frills

PHOTOGRAPH FROM *LADY OTTOLINE'S ALBUM*, COURTESY OF ALFRED A. KNOPF, INC.

Lytton Strachey and Virginia Woolf of the Bloomsbury group: a signal of androgyny in a single, silent falling leaf

sive, countercultural movement. Those connections still hold. Androgyny in the seventies has been limited to the educated middle class and the radical counterculture. You look for androgynous styles in *Vogue* and Bloomingdale's, not *McCall's* and Penny's. Economic status and social registry somehow give people the security to discard the anchors of sex roles.

Androgyny in the twentieth century may have begun in England, but it is hardly surprising that it is blooming in America. There are both particular and general forces contributing to its forward motion. The economic necessity for women to work—and its social acceptance—has made the old roles of housewifery, and the emotions that go with them, absurd and often dysfunctional. Simply to break through conventional feminine roles is to move towards an androgynous synthesis.

But beyond that, the constellation of brand-new needs, demands and desires in "postindustrial" America has brought across-the-board changes in consciousness. For instance, the transformation of the nature of work from farm and factory to "services" has propelled many young men out of traditional "masculine" work roles and the emotional haberdashery suited to those jobs. Their new roles often let them share family roles formerly consigned to women. The men do not automatically become androgynous, but they are not so securely tied to the masculine pole any more.

Along the leading edge of change, the vectors point toward equality—in the political economy as well as the political culture. If the coming issue in government is redistribution of wealth, the issue in human relationships is the redistribution of power. It is equality not for its own sake, not because it is self-evident or endowed by the Creator, but because the next stages of social evolution cannot function well without it. The sage political economist Robert Heilbroner wrote recently that the gross inequalities of American capitalism will destroy it. In the same way, gross inequalities in communities and families will destroy them. Alexandra Kaplan and Joan Bean see androgyny growing as the structure of the acquisitive society weakens. "A society that supports androgyny would probably not be based on capitalistic consumerism, which is a direct outgrowth of the competitive, achievement-oriented values of the male model. Flexibility in sex-role norms seems to be more related to a social-welfare economy," they say.

Gloria Steinem noted recently that hard and fast distinctions between the sexes always accompany stages of imperial expansion in a society—those times when men think it necessary to keep women semislaves, in order to bear and rear offspring for the expanding nation. As we near a no-growth, resource-short, shrinking political economy in America, she continues, the polarized patriarchy will begin to break up.

In time, evolutionary changes may follow the economic ones. If women are less necessary as sexual objects and men as sexual subjects, their physical characteristics could be transformed. Gone would be the classic Rubenesque female, two-thirds breasts and hips; gone too the stallionoid male, the walking phallic symbol. There need be no dimunition of sexual activity or pleasure. In fact, psychologists find that sexual fulfillment is increased as partners move toward an androgynous center. One writer told me, "Men and women who keep to the myth of their sex type stay separated even when they're together. They are afraid of each other, always aware of the differences. They may extol those differences, but the important ones aren't in their sex attributes but in their humanity. Androgyny doesn't mean a race of sexless androids, but a wider variety of sexual possibilities than exists now."

The convulsions that will accompany the collapse of the old sexual culture will make most recent political events seem puny by comparison. In fact, they may have already begun. A great deal of nonsense will be loosed upon the world, as freed men and women scramble for new standards of behavior and anchors of being. People will mistake transient excesses for final accountings, bemoan the leveling of differences, extol the former virtues. Those with vested interests in polarized roles will predict the direst consequences of androgyny. They will not only be men. Or women. Renee Richards, the transsexual, sees only calamity arising as the familiar signposts fall.

"If someone can be sex-tied," she sighs, "there's so much less anxiety. I mean, I'd rather have pink rooms for girls and blue for boys. How can you tell who's who in a yellow room?" ●

Genetic engineers are splicing together cells to create new forms of life. Are they on the track to a cancer cure—or on the path to biological disaster?

PLAYING GOD WITH DNA

By Arthur Lubow

It would be so much simpler if they would just say there's no risk. No danger of infection, no way a man-made microbe can crawl out of a lab and start an epidemic, no chance that manufacturing new organisms will derail the locomotive of evolution. So you ask hopefully: "Is there any risk?" And instead of an answer, you get an analogy.

"There is a possibility that a band of monkeys could type out the Preamble to the Constitution," says a Harvard Medical School professor. "But it is such a small probability that we don't even have numbers to express it." The monkey analogy is a good one. It appeals not to your knowledge of the simian mentality, but to your common sense. Who knows? Maybe if you put a dozen monkeys in Independence Hall, they would feel inspired. But you give the professor the benefit of the doubt; and he hopes you will be equally generous about his work with recombinant DNA. When he splices together two cells to create a new living organism, he is confident that nothing sinister will happen. Since you're watching over his shoulder, he wants you to be confident too.

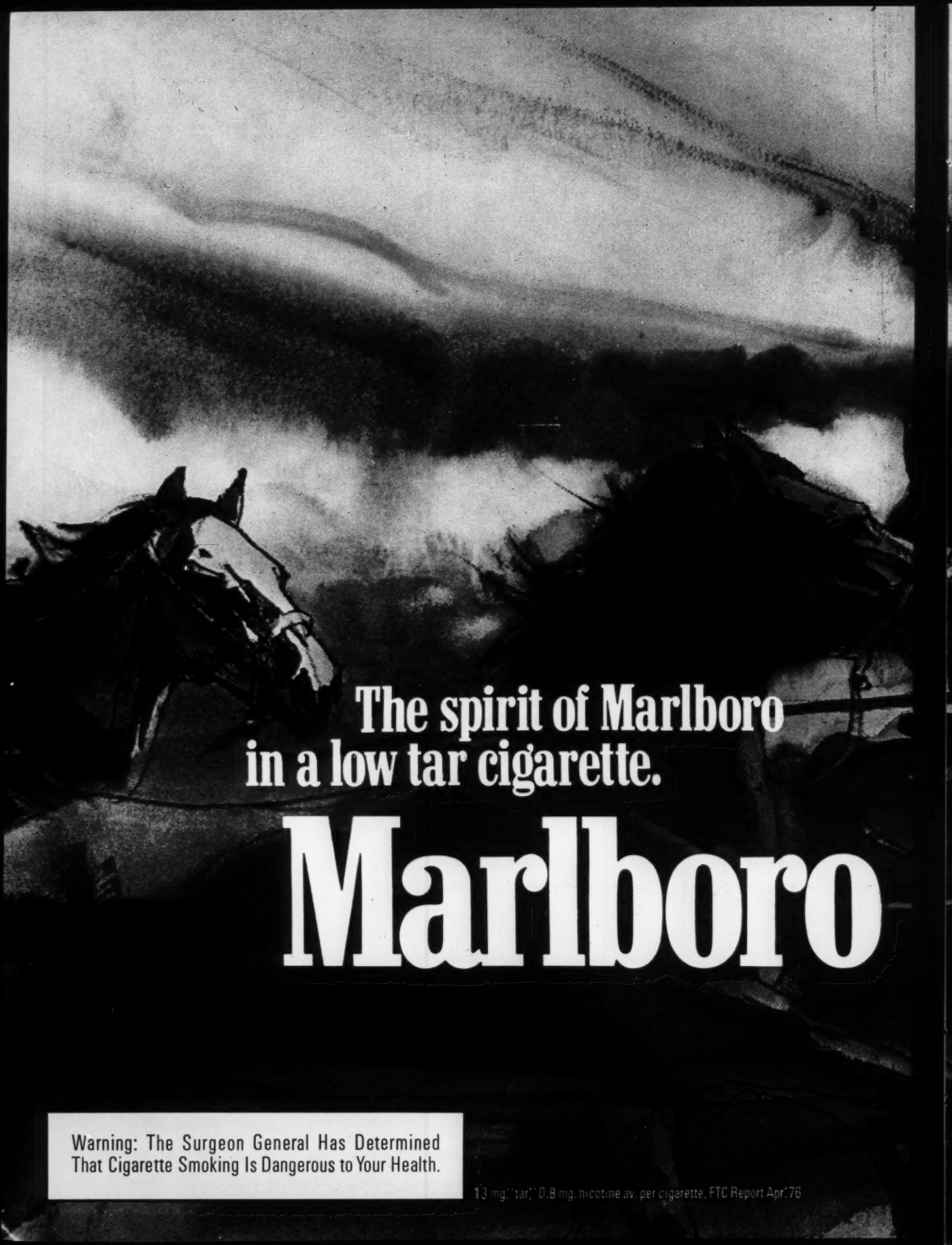
An amateur celebrity, the researcher is nervous: he blinks like a bat in the light. He is accustomed to obscurity. Thousands of whitecoated scientists work quietly in their laboratories, writing articles with polysyllabic titles for arcane journals—and most of us could not care less. "I am not much interested," said a former secretary of defense, "in why potatoes turn brown when they are fried." But every once in a while a paper marked with chicken scratchings explodes with the power of a thousand suns. We look at the mushroom cloud over Hiroshima, and suddenly we want to know everything. A scientific question has become a political problem, and the man with a pencil or test tube is suddenly a public personage. The recondite paths of nuclear physics led to the perilous crossings of atomic power. And now molecular biology, the most exciting frontier of modern science, has brought us to a similarly troubling vista.

For the first time, the scientific establishment has announced that there are some nonhuman experiments that should be prohibited. For the first time, a community—Cambridge, Massachusetts, the home of Harvard and MIT—has declared that it will not permit certain scientific work to proceed within its borders. "People want to know what the hell they're doing in these laboratories," says the mayor of Cambridge. "And since they're spending United States tax dollars, we have a right to know." A scientist warns in the *New York Times Magazine* that recombinant DNA work may "endanger the future of mankind." Scientists have formed two camps, each savaging the other's intelligence and integrity.

The controversy is flaring on the front lines of science: molecular biology. Since the 1950s, molecular biologists have scooped up the lion's share of Nobel prizes in medicine and physiology. Buckets of federal money have irrigated the field. Compared to its sisters, chemistry and physics, biology is still an infant, but in the last two decades it has grown faster than the hyperpituitary boy in a Wonder Bread commercial. Scientists now have a fair understanding of the genetic process in primitive creatures such as bacteria, but they have never had a way to examine the setup in animals similar to man. They now have a way. It is called recombinant DNA.

"It is a revolution," says James Watson, who won a Nobel prize for his work on the structure of DNA. "It is *the*

ILLUSTRATION BY CARLOS OCHAGAVIA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way to go. I would say that everyone who is seriously interested in the detailed structure of the gene is now using this technology." Just as splitting the atom accelerated the progress of physics, so recombinant DNA can speed the growth of modern biology. Researchers say their work may even disclose a cure for cancer. But theoretical risks accompany potential benefits, and the threat of recombinant DNA has been compared to the danger of nuclear radiation. Not since the congressional investigations of atomic energy in the fifties has science sparked such a heated political discussion. Scientists all over the world are watching the Cambridge saga. They know that the threat extends beyond Harvard and MIT. There is a domino effect. Already the United States Senate, the New York State Attorney General and the cities of San Diego, Princeton, New Haven and Bloomington, Indiana, are pondering the public health dangers.

Not only molecular biologists are worried. The mayor of Cambridge is turning his sights on other laboratories. The NIH (National Institutes of Health), which drafted guidelines for work with recombinant DNA, is considering similar restrictions on all experimenters with animal cells. A chink in the form of a question mark has cracked the scientific megastructure. There hasn't been such a fateful biological question since the Sphinx posed the riddle on the road to Thebes. But among all these scientists there is no Oedipus, and the question lingers unanswered in the air.

Is there any risk?

For the crucial questions about recombinant DNA, we have very few answers. The scientific technique, though, is disarmingly simple to understand. The genetic code for every form of life is contained in a giant molecule called DNA. The DNA molecule or a close relative is found in all cells, from amoebas to zebras. Of course every cell is full of molecules, but DNA is the king of the roost. It decides which proteins a cell will synthesize. By manufacturing the proper proteins, a cell can perform its individual function—producing insulin, transmitting nerve impulses, growing a blond hair. It is the DNA that decides whether a cell will be part of a man or a mushroom.

In molecular terms, sexual reproduction is merely a mingling of DNA. Each parent contributes half a DNA set to form a new cell. Obviously, the new cell is a recombination of the parents' DNA; but the word "recombinant" is reserved for something far less common—the recombination of DNA from different species.

The mouse who falls in love with an elephant is a likely subject for a droll fable. Everyone knows that animals from different species can't mate. In some cases, closely related species are able to have a go at it, but often the offspring are sterile: for every nectarine, there is a mule. But in biological laboratories, modern Dr. Frankensteins have found a way to create brand-new forms of life. Perhaps it's a sign of the times that the new creatures are not ten-foot monsters with spokes through their necks, but colorless cells invisible to the naked eye. The DNA of mice and elephants can now be joined—inside bacteria.

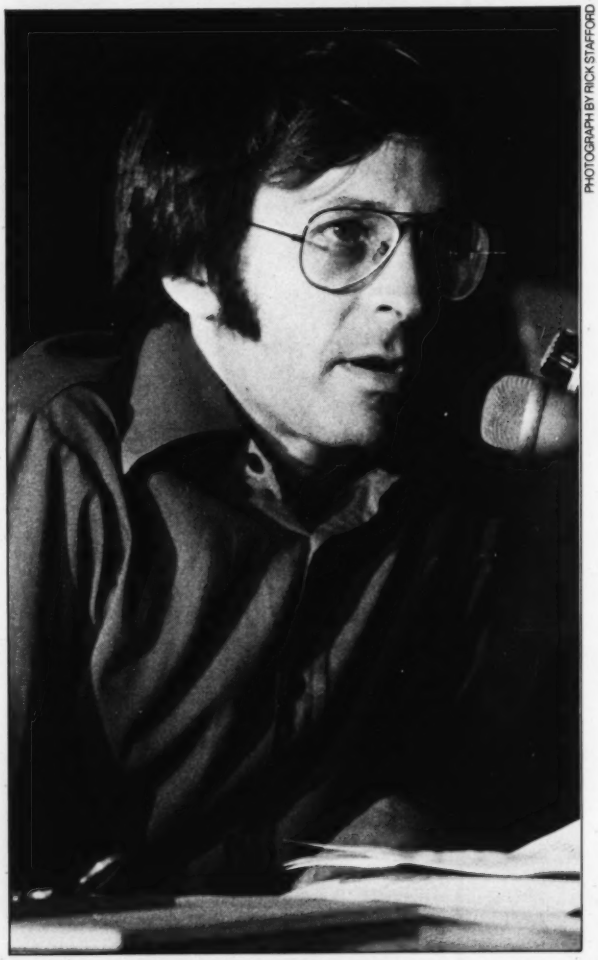
The DNA molecule in bacteria usually takes the form of a chromosome ring. However, many types of bacteria have snippets of DNA left over, which appear as smaller rings in the cell. These rings are called plasmids. When bacteria reproduce asexually, both the chromosome and the plasmids duplicate themselves, the cell divides, and *voilà!* Two cells. With some bacteria, this happens every 20 minutes.

A modest bit of merchandise, the plasmid, but it boasts two very useful features. It can often move from one cell into another. And it can be split in specific places by substances called restriction enzymes. For the recombinant DNA maestro, these properties make it worth considerably more than its weight in gold.

Using restriction enzymes as chemical cutters, a scientist can split the plasmid DNA and the DNA of some other organism—say, a mouse. He can then take a piece of the mouse DNA and insert it into the plasmid, seal the plasmid up with other enzymes, and put it back into the bacterium. When the bacterium divides, so does the plasmid, including the mouse DNA portion. In a day, the scientist can have millions of pieces of the mouse DNA he wants to examine.

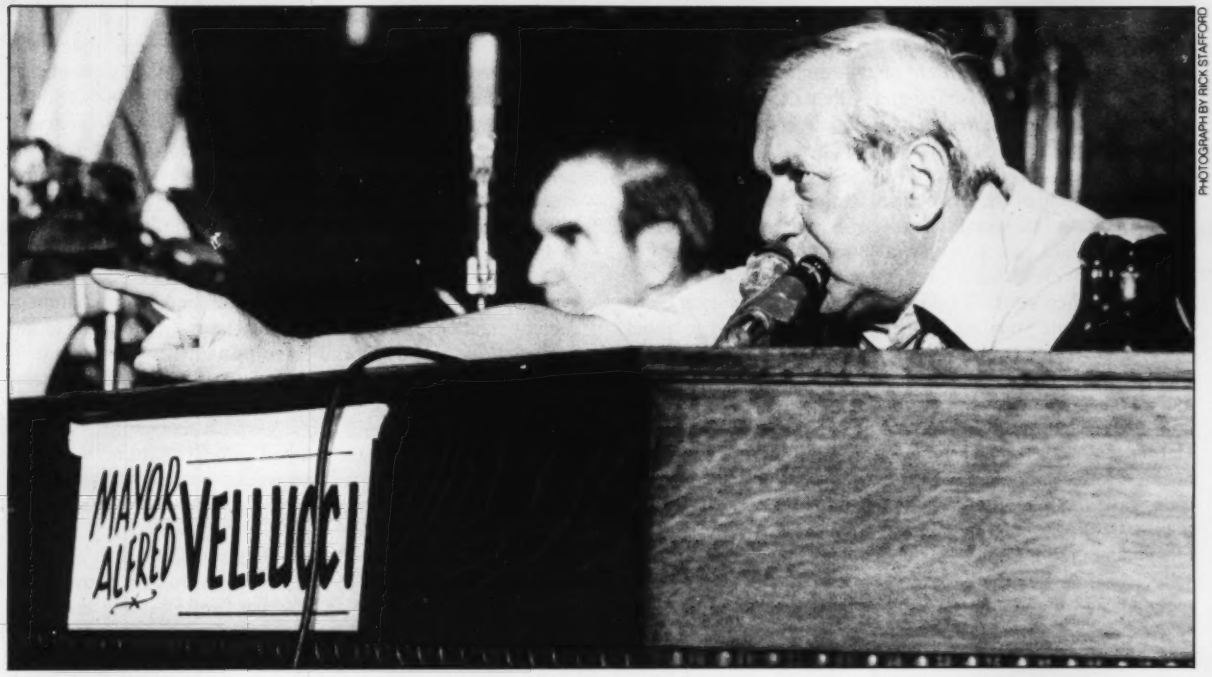
But every silver lining has its cloud. Bacteria are wonderful reproduction machines, making limitless quantities of identical mouse, cat, fruit fly or other kinds of DNA to order. They are so useful because, even after you perform recombinant surgery on them, they are still free-living organisms. As it happens, the particular bacteria that scientists use for this transaction, *E. coli*, live quite happily in a wide range of locales, including the place they're named for, the human colon or bowel. If swallowed accidentally, they might take up residence in the human body. And so they pose—a risk.

In one dire vision, conjured up by critics of recombinant DNA research, some *E. coli* bacteria carrying foreign



PHOTOGRAPH BY RICK STAFFORD

Mark Ptashne: Speculation that researchers will create Andromeda-type germs is "not scientific talk—it's science-fiction talk."



PHOTOGRAPH BY RICK STAFFORD

Mayor Alfred Vellucci: "I have an obligation to a whole lot of lay people. . . . And so I don't want to take a chance."

genes escape from the laboratory and perform untold mischief in the human body. To honor Michael Crichton, in whose novel, *The Andromeda Strain*, bacteria from the upper atmosphere wreak bloodcurdling havoc on earth, we shall call this the Andromeda-strain scenario. In another more mystical vision, the introduction of new forms of life upsets the master plan of evolution. Of special concern is the mongrelization of higher life forms with primitive organisms like bacteria. We shall call this the evolutionary-disaster scenario.

Our heads filled with nightmares, we run to the scientists for some answers. To our chagrin, we discover a Catch-22: the riddles posed by recombinant DNA technology can be solved only by experimenting with the technology. There are too many unknowns to give a flat answer. On the Andromeda-strain scenario, Charles Thomas of Harvard Medical School is skeptical: "The idea that one could paste together two segments of DNA so that that act would simultaneously confer a selective advantage on that organism and have it be dangerous is something I can't buy." Across the river at Harvard College, Mark Ptashne offers an extended metaphor: "If you tell somebody from Mars you're going to put a Ford motor on a lawn mower, he asks, 'Can it be dangerous?' You say it may be. He says, 'It may destroy the world.' You say that is very unlikely, but you can't prove it won't. It's not scientific talk. It's science-fiction talk. Every time you make a mutant of *E. coli*, you can't be sure what will happen, but all attempts to make the strain virulent have failed."

Talk about evolutionary disaster is even less concrete. "I don't think we are doing something which has never happened before," says James Watson. "But it's impossible to say. It's not a meaningful question." Unlike Watson, David Hogness of Stanford, a leading researcher in the field, does not dismiss the question. He argues that recombinations *are* part of evolution. He challenges the notion that, in nature, genetic material does not leapfrog across species barriers. He thinks there are natural mechanisms by which animal DNA can enter a bacterial chromosome: "People started in this field with the assumption that we were doing something new that had never been known in the world, but I no longer think that is true." Another pioneer in recombinant DNA work, Paul Berg of Stanford, is more forthright: "There isn't a single person that I know of who can document the existence of a barrier."

And so, in the absence of facts, the debate turns to personalities, to my word against yours, to imaginative scenarios. The debating platform moves from the musty pages of medical journals to the strobe-lit hearing rooms of politicians. And in the commotion, in the clouds of smoke above hypothetical fires, an uncrackable nut of a question remains unanswered.

Is there any risk?

Around Harvard Square, Cambridge Mayor Alfred E. Vellucci is known as the man who wanted to convert Harvard Yard into a parking lot. Just the thought of an ax touching one of those majestic elms is enough to choke the throat of any crimson-blooded alumnus. Few men besides the fun-loving mayor recall the birth of this legend. "In 1957, student cars were everywhere, and the people of Cambridge had no place to park their cars," Vellucci recounts in his thick Boston accent. "I wrote to Harvard and MIT and got no answer. I wrote again. No answer. So I proposed to the city council that we cut down the trees in Harvard Yard, pave it and turn it into a parking lot. You should have seen how fast they moved! They got their cars off the street immediately."

After the parking affair, Harvard appointed a special representative for community relations, but the relations are still not so good. "Oh, you know," Vellucci says, "like a couple of lovers—off again, on again." The mayor and Harvard are fighting these days over the construction of a medium-containment laboratory to be used, among other purposes, for work with recombinant DNA. The building would be nearly completed had Vellucci not read a June article in the Boston *Phoenix*, a local weekly. In the article, entitled "Biohazards at Harvard," professor of biology Ruth Hubbard was quoted as

saying that the risks of recombinant DNA are "worse than radiation danger."

Vellucci read the article on the Monday morning it appeared. While he was discussing it with his aides, a secretary announced that George Wald and Ruth Hubbard were outside. "They came in and they talked to me about the thing and it was dangerous," Vellucci recalls. "So I said to them, 'If I call a special meeting of the city council to discuss this matter, will you come?' And they said, 'Yes.' "

Dr. Wald remembers it a little differently. A white-haired man with a theatrical personal style (as someone remarked, "When you talk to George, you always imagine there are 5,000 people standing behind you"), Wald won a Nobel prize in 1967 for his work on the visual pigments of the eye. More recently he has been celebrated for his speeches on behalf of the antiwar movement and other left-liberal causes. He and his wife, Ruth Hubbard, are both biology professors at Harvard. Wald says that even before their talk Vellucci had decided to call a meeting. But the Walds were instrumental. They gave the mayor what he needed—"people with credentials." Vellucci explains: "If I'm gonna take a stand against this goddamn thing, I need some people on *my* side. And since they said they would come, I was fortified, I was ready for a meeting, and that is the reason why we then flung the challenge at Harvard and MIT to send *their* scientists over here because I knew *I* had scientists on *my* side!" He pounds the table for emphasis.

"Who the hell do the scientists think that *they* are," the mayor growls, "that they can take federal tax dollars that are coming out of our tax returns and do research work that we then cannot come in and question?"

As it turned out, there were two meetings, because so many people wished to speak. The meetings were staged before overflow crowds on hot summer nights, made even hotter by the glare of television lights. In addition to the Walds, Jon King, an associate professor of biology at MIT, appeared as a major spokesman against the work. On what Vellucci likes to call "the Harvard team" there were several Nobel laureates and other distinguished scientists. To open the first meeting, a contingent from the Cambridge public high school sang "This Land Is Your Land." Who's in charge here: citizens or scientists? The point was clear.

"It's about time the scientists began to throw all their goddamned shit right out on the table so that we can discuss it," Vellucci growls. In his office hang framed portraits of past mayors, palpable presences admonishing him to safeguard the health of Cambridge citizens. "Who the hell do the scientists think that *they* are that they can take federal tax dollars that are coming out of our tax returns and do research work that we then cannot come in and question?"

In his cranberry doubleknit jacket and black pants, with his yellow-striped blue shirt struggling to contain a beer belly, right down to his crooked teeth and overstuffed pockets, Al Vellucci is the incarnation of middle-American frustration at these *scientists*, these technocrats, these smartass Harvard eggheads who think they've got the world by a string and wind up dropping it in a puddle of mud. And who winds up in the puddle? Not the eggheads. No, it's always Al Vellucci and the ordinary working people who are left alone to wipe themselves off. "They say, y'know, it's all right to dip apples into red dye, to dip candy into red dye, and don't worry about it, it doesn't affect you at all. And then you have the United States Department of Drugs come out and tell you, no, don't eat any more apples dipped into red dye, y'see, don't eat any more candy that's been dipped into red dye. And everybody's saying, don't take the pill because we're gonna tell you why the pill is no good for ya—y'know, these are all *scientists* who did all this work." Al Vellucci isn't buying any of it.

After the second meeting last July, the Cambridge city council voted a three-month ban on all medium-containment recombinant DNA work. The council later extended the moratorium through mid-December, to provide time for a council-appointed study group to prepare a review and recommendations. The council is closely split on the issue, and no one is predicting its final verdict, but Vellucci has already decided how he will vote. "I have learned enough about recombinant DNA molecules in the past few weeks to take on all the Nobel prize winners in the city of Cambridge," he says. "Regardless of what the review board says, I'm opposed to this work. If they say they're against it, fine, they're against it. If they say 'We're in favor of this thing with safeguards,' it is my intention to call up Dr. Wald, Dr. Hubbard and Dr. King and invite them into this office and have them sit down and go over the whole review with me. I have an obligation to a whole lot of lay people in this city who do not understand this whole goddamn thing. And so I don't want to take a chance."

The controversy over recombinant DNA has a particular poignancy for Paul Berg, because he was the first person to raise the question of risk. Six years ago, in his Stanford laboratory, Berg discovered a way to construct synthetic tails for DNA molecules. By adding these "sticky ends," he planned to insert a given DNA fragment into *E. coli* bacteria. The DNA he wanted to examine, SV 40, has been carefully studied by geneticists because it is able to incorporate itself into the chromosomes of the host cell. It also causes cancer in mice. With his newfound technique, Berg hoped to clone segments of SV 40—to multiply it by using *E. coli* as the host. He never thought of a possible danger: by transforming a cancer virus, he might be manufacturing a mutant with malignant powers.

In the summer of 1971, one of Berg's graduate students was attending a summer program at Cold Spring Harbor laboratory in New York, and she described Berg's experiment to an audience of biologists. The reaction was one of shock. "Several people called me up and pleaded with me not to do it," Berg recalls. "I went to talk to a number of scientists, and they all said not to do it—the unknowns were too great and the risks too significant. I could never convince myself or anyone else that I could reduce the risk to zero. So we turned that experiment off."

Two years later, at a summer conference of biochemists held in New Hampshire, Herbert Boyer of the University of San Francisco described his experiments with plasmids and restriction enzymes. Because natural substances—restriction enzymes—created the "sticky ends" that Berg had laboriously manufactured with synthetic tails, Boyer and others could now easily concoct hybrid plasmids, recombining the DNA of bacteria and other organisms. "It was obvious to everyone in the room that now you could do these things, that you didn't need anything fancy—all you needed were the restriction enzymes," says Berg. The conference authorized a letter, published in the journal *Science*, warning that since new organisms "with biological activity of unpredictable nature" could

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be created, "prudence suggests the potential hazard be seriously considered."

Because Berg had grappled with these issues two years earlier, the National Academy of Sciences, to which the public letter had been addressed, asked him to form a committee. And so in the spring of 1974, a committee of a dozen leading molecular biologists met at MIT and drafted a second public letter. If there is anything in this world that reproduces faster than bacteria it is committees, so, naturally enough, one of the MIT committee's recommendations was the formation of a committee by the director of the NIH to develop guidelines for researchers of "potentially hazardous recombinant DNA molecules." The scientists also called for an international conference to discuss the problem; the conference was held in February 1975 at the Asilomar center in California. In anticipation of the conference, the MIT group asked researchers to refrain voluntarily from two types of experiments: the introduction of toxin-formation or antibiotic-resistance genes into bacteria that do not naturally contain such genes, and the addition of tumor virus or other animal DNA into bacteria or viruses—since such hybrid organisms might "possibly increase the incidence of cancer or other diseases."

By the time of the Asilomar conference, some scientists were beginning to have second thoughts. They feared that dramatizing the risks had been a mistake. Joshua Lederburg, a Nobel laureate and one of the giants of molecular genetics, pointed out that the MIT letter implied that scientists could not be trusted to police themselves. James Watson had another worry. "The scientists were a bunch of jackasses for raising the question of danger when they could not quantitate it," he says now. "I became very worried about the whole thing because in setting regulations I couldn't decide whether it was more dangerous to put yeast DNA or drosophila DNA or human DNA into *E. coli*, and I couldn't distinguish the difference. I just found the whole Asilomar thing irrational."

Organisms produced through recombinant DNA work, a scientific group warned, might "possibly increase the incidence of cancer or other diseases"

What was created at Asilomar was a graded-risk system of regulation. Some work would be banned outright for now—roughly, the sort of experiments described in the Berg moratorium letter—and other experiments could be conducted only under specified conditions. The threat was that organisms posing unknown dangers could escape from the lab; the procedures thrashed out at Asilomar would confine experiments believed to be potentially hazardous to more carefully controlled laboratories. Two sorts of containment procedures would be used. The first, physical containment, assigned experiments to workplaces with increasing safety provisions, ascending from P1 to P4. A second system of biological containment required for certain experiments the use of deliberately weakened *E. coli* which, even if they escaped, would be unable to survive outside a pampered laboratory environment. With some modifications, these regulations were adopted by the NIH (and later by the National Science Foundation). Although it has no police powers, the NIH provides funds for most of this research and it therefore wields a formidable carrot.

That is how the matter rests today. The NIH guidelines are in use. Most scientists are reconciled to them; a smaller group think they are needlessly strict but grudgingly follow them. However, there is a third group of scientists unhappy with the regulations, and although relatively small in number, they speak in a loud voice. For they think the guidelines are irresponsibly lax, and if experiments proceed, the public health and even the future of the planet are threatened.

In drafting guidelines, the scientists at Asilomar and NIH worried mainly about the threat of an epidemic—the Andromeda-strain scenario. But even with the recommended precautions, some critics fear the experiments are hazardous. Because no one understands the intricacies of cell genetics, no one can say with assurance that an apparently innocuous combination of genes will not produce a virulent strain of *E. coli*. The pathogens needn't be as flamboyant as the fictional Andromeda strain, which congealed the blood into paste. "What worries me," says Jon King of MIT, "are the organisms where you won't identify the symptoms. If you're making a really virulent agent, you'd catch it. We're talking about things that would affect you in very mild ways."

To pose a hazard once it escaped, an organism must do three things: survive outside the laboratory; beat out enough competitors in the already existing jungle of microorganisms to establish an ecological niche; and produce some dangerous effect, since the great majority of bacteria are harmless. Most scientists believe the odds against the accidental creation of such an organism are inexpressibly great, but Jon King is unconvinced. "Especially in a technological society that is filled with new chemicals, there is a very good chance that there are new niches that can be exploited," he says. "We do not understand why some microorganisms make you sick. These people are saying they can't possibly make a pathogenic organism, but they can't even tell the difference between existing pathogenic and nonpathogenic organisms. It's an argument you make because you want to refute the possibility of danger without exploring it."

Andromeda scenarists object vehemently to the use of *E. coli*, bacteria that live happily in our gut. "A few years of research would have led to an organism other than *E. coli*," says Erwin Chargaff, a retired Columbia professor who worked on nucleic acid composition in the 1940s. "This is really incredible. It's beyond imagination. Because *coli* is a symbiont of all of us, it is part of us, more than any other organism. Now the argument is we know more about *E. coli* than any other organism. But I think such clever people could learn in five or ten years enough about other organisms."

Experimenters with recombinant DNA stress that they are using a strain of *E. coli* that is not known to survive outside the laboratory. For research that seems especially hazardous, an even weaker variety of *E. coli* is required. "I recognize that *E. coli* represents a risk—we pointed it out in the first letter we wrote—but the insistence that we abandon this research until we find another organism is unrealistic," says Paul Berg. "We may never find another organism. We have an incredible background of information on *coli*. It would be necessary to find an organism that you can predict will be safe when you find it." James Darnell of Rockefeller University argues that because so much is known about it, the laboratory strain of *E. coli* "is not the most dangerous but perhaps the safest organism to use." "I would definitely feed recombinant DNA to my 16-year-old daughter if it were not considered idiosyncratic," says Charles Thomas of Harvard Medical School. "It goes without saying I'd drink it myself."

But disease is not the only concern. Even if no Andromeda-type germ is produced, Robert Sinsheimer fears, re-

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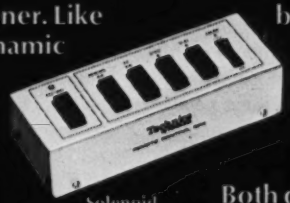

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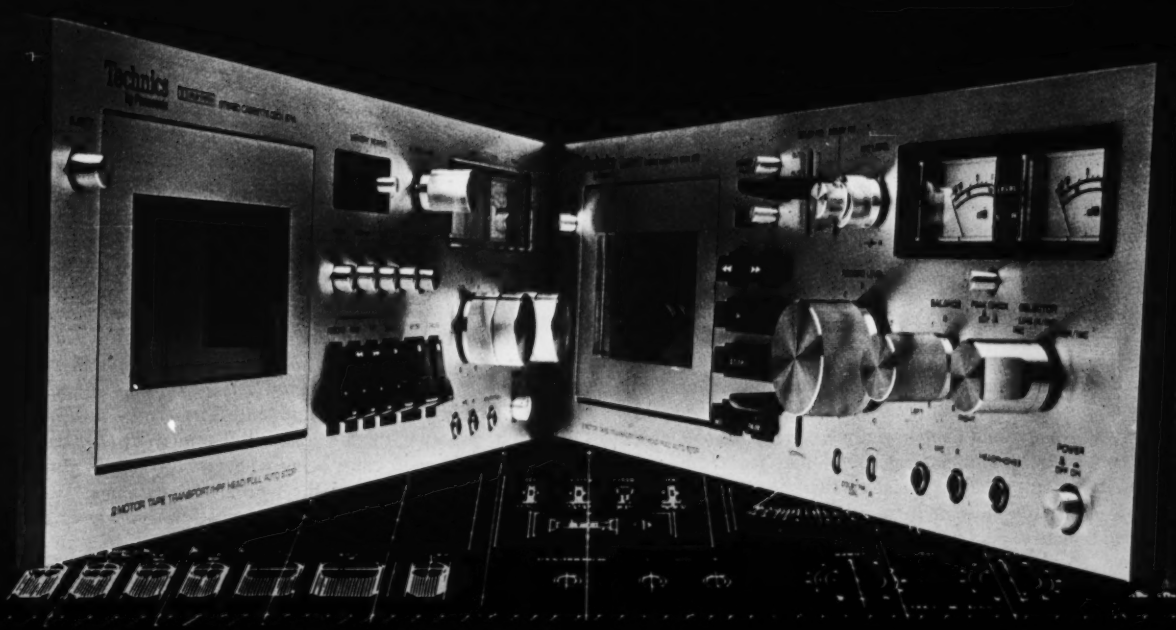

combinant DNA work jeopardizes life on this planet. Sinsheimer, chairman of the Caltech biology department, is the leading spokesman for the prophets of evolutionary disaster, the second scenario. This Southern Californian, tan beneath his white tennis shirt, speaks with the fervor of a repented sinner, animated by the same passions that drove former Communists like Whittaker Chambers to lead the red-baiting crusades of the fifties. Only six years ago Sinsheimer was predicting that man could "rise above his nature to chart his destiny," and that in genetic engineering lay "the potential for worlds yet undreamt." He has had second thoughts.

Sinsheimer is now the most eminent opponent of the guidelines. He fears that even if no virulent recombinant is produced, merely the exchange of DNA among organisms that normally honor barriers as rigid as South African apartheid can have dire evolutionary consequences. In the evolution that Darwin described, new combinations of genes are constantly formed by reproduction within a species. Occasionally, a novel combination or a spontaneous mutation provides a natural advantage to an organism, and that organism is better equipped to survive. It lives longer, it reproduces more often and its genes have a greater likelihood of persisting. Over a time scale of aeons, more organisms with these genes survive, and the species gradually evolves in a particular direction.

Sinsheimer argues that an especially rigid barrier divides the genetic material of lower forms lacking a defined nucleus, such as bacteria, and higher forms such as animals and plants. This taboo is now being broken by man. "Genetic recombination among species has not been allowed in nature," he says. "I'm willing to concede it may happen occasionally, but there's no evidence for it and I have no idea of how to estimate the rate. You are changing in a short period of time the biological equilibrium that has been evolving over a very long period of time. The consequences are unpredictable. If these organisms do reproduce and find a suitable niche, there's no way we can get them back. We can't even find them. And how do we know what will evolve after they're out?"

"I would definitely feed recombinant DNA to my 16-year-old daughter if it were not considered idiosyncratic," one scientist says. "It goes without saying I'd drink it myself"

To a scientist, the intuitiveness of Sinsheimer's argument makes it seem almost mystical. "I think Sinsheimer has allowed his imagination to crawl away with him," says Nobel laureate David Baltimore of MIT. Sinsheimer's argument evokes a passionate response for two reasons. First, he is an eminent scientist, and he can't be brushed off with talk of professional jealousy or pitiable ignorance. Second, he talks of unknowables and unquantifiables, so his opponents find themselves shadow-boxing with phantoms.

"One of the tragedies is that Bob Sinsheimer refuses to be specific and articulate his concerns," Paul Berg complains. "What is this barrier? What is the evidence that there is this barrier, and what would happen if it were breached? What he talks about is that it is unnatural. When they wanted to start immunizing people, that was also said to be unnatural. For one guy, no matter how eminent he is, to go up and say 'I fear,' and then to expect the whole world to stop—I don't care how eminent he is, it's not going to happen."

Still, Sinsheimer is undaunted. "The burden of proof belongs on the other side," he says. "I've thought about the problem of genetic engineering longer than most people and I'm not as sanguine as I would have been ten years ago." He favors phasing out the use of *E. coli* in recombinant DNA work "as fast as possible" and the confinement of all experiments "transferring DNA between species that do not normally exchange genetic material" to P4 (top security) facilities. He believes the NIH guidelines are too soft. "I don't think it's smart," he says. "I don't think it's sensible. We've got only one biosphere. The graded-risk concept doesn't make sense when you have only one thing to lose, as in the biosphere. I think the potential exists for some kind of biological catastrophe through the introduction of new kinds of organisms. You've got to be more careful. You can't just go blasting ahead when so much is unknown in an area of potential catastrophe."

Slow down. That's what the critics say, and they think they're being quite reasonable. "What kind of disaster could happen from going slow?" asks Jon King. An aide to Mayor Vellucci says he is puzzled: "I don't quite understand what the enormous urgency to plough ahead is based on." If the research poses a serious risk, why not proceed under the tightest P4 conditions, until the light of knowledge wipes away these shadows of doubt? Why the rush?

But asking scientists to slow down is like asking hawks to walk. It goes against their nature. "Chargaff's thing to slow down—this is a perfectly normal response for someone who hasn't *moved* for the past 30 years," says James Watson, his watery blue eyes gleaming, his hair wiring off his head as if electrically charged. Chargaff isn't the only loud-mouthed tortoise on Watson's list. "Ruth Wald hasn't had a good idea in ten years," Watson says. "She hates molecular biologists because she isn't one. She and this pitiful little Ursula Goodenough [another Harvard geneticist who opposes the work] . . . . They resent people who work harder than they do. If people didn't work so hard, there wouldn't be such a difference between Ursula Goodenough and real scientists. I'm sure Ursula would like science to slow down. If it slowed down, she could be part of it."

In science, the slow of foot drop out of the race. Already European researchers working without guidelines have performed experiments that Americans are itching to try. "Essentially our work is crawling," moans Paul Berg. "This thing is slowed down now. I can't do the experiments I could do. We're not doing one-tenth of what could be done." David Hogness says if King and Sinsheimer had their way and assigned his research to P4 conditions, "I wouldn't do it. I wouldn't do experiments under Mars-shot conditions. It would be a serious question whether I would continue the research."

The most irritating thing about this controversy is it takes up so much time. Matthew Meselson of Harvard informs a reporter at 10 a.m. that this is his fifth call from the press that morning; as they speak, his secretary takes call number six. David Baltimore of MIT says, "At this point, 30 percent of my time is being taken up by talking on this issue." It is not just the hours subtracted, it is the diffusion of energy, the distraction from single-minded effort. To be a first-rank scientist, you must think science all the time. When you come home at night, you can't bring your test tubes with you, yet your mind lags behind in the laboratory. As James Watson puts it, "It's a world of total domination—you have to be manic."

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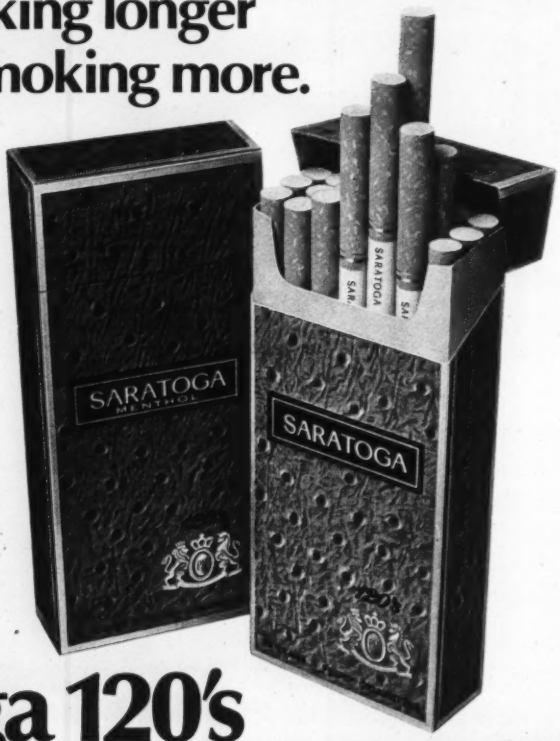

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Not since the Vietnam war has there been a distraction the size of the recombinant DNA controversy. From their perspective as scientists, the defenders of the research are horrified by the time lost. But, as political animals, they concede the dispute has had some good side effects. "I think about recombinant DNA and the ethical issues and the arguments on both sides," says Tom Maniatis, the man for whom Harvard is building its P3 (medium-containment) lab, "and in that sense it has represented a major distraction. But in many ways, I have found the situation for me has been very positive. It has forced me to think about the relationships between science and society."

One of the many ironies of the recombinant DNA controversy is that the scientists under attack are finding themselves on the unfamiliar side of a political issue. As a group, molecular biologists are extremely left-wing, even in a liberal university context. Because their political philosophy forces them to support public participation and control, they twist in uncomfortable contortions when responding to their leftist critics. "Increasing community control of science, which I used to support, now worries me," Mark Ptashne muses. "If you ask the average guy on the street, 'Do you want to hook up a mouse gene to a human gene?' he says, 'What good will it do?' You say, 'It may help our understanding of the gene.' He says, 'How much does it cost?' You say, '$50,000.' He says, 'Hell, no.'"

Times like these make a man appreciate the dictatorship of the proletariat. In the winter of 1970–71, Ptashne visited North Vietnam and to his pleasure found that the government of this socialist country supported advanced scientific work. One senses he would be quite happy in a worker state, guided by enlightened leaders who recognize Comrade Mark's achievements. "To me science is a cultural activity," he says. "One of the things that amazed me most about Hanoi was that in the middle of the bombing, they wanted to know about the lambda virus I was working on. They knew everything in the field up to the last year or so. I said, 'You guys are fighting for your lives—why do you care about this?' Even I was alienated from this work by that time. They said, 'We regard science as a basic form of human activity.' Science as a cultural endeavor makes more sense to them than it does to us."

Left-wing scientists endorse the ideal of community control, but, in practice, they are waiting for the ideal community. The communities they live in fall far short of the ideal. When Al Vellucci says 99 percent of the people of Cambridge would vote against recombinant DNA work, you can take his word for it. Cambridge citizens oppose the research because they can't see what good it will do them; they can only see the risks. "I don't think these scientists are thinking about mankind at all," Vellucci says. "I think that they're getting the thrills and the excitement and the passion to dig in and keep digging to see what the hell they can do." Vellucci's conception of the scientist jibes neatly with the definition given by the great sociologist Max Weber: "An inner devotion to the task, and that alone, should lift the scientist to the height and dignity of the subject he pretends to serve. And in this it is no different with the artist." That's what Mark Ptashne means when he calls science "a cultural endeavor."

The scientific world is no democracy. It is a hierarchical, aristocratic world, in which a man speaks with the authority of his accomplishments. Nobel laureates (in science, unlike literature, Nobel prizes reliably honor genuine achievement) constitute a nobility of the robe. You are what you do. Somehow the public senses that in the scientist's heart the outside world is irrelevant. In the search for knowledge, in the quest for a Nobel-size discovery, social concerns are a distraction.

Working in his dungeon laboratory, Dr. Frankenstein can't be bothered by intruders. He is a genius, he has uncovered the secret of life, and no one can stop his research. Only when his monster begins to destroy does he realize what he has done; and by then it is too late. In an interesting essay, Robert Brustein examined the horror-movie genre and found that Frankenstein is the public image of the research scientist "so obsessed with the value of his work that he no longer cares whether his discovery proves a boon or a curse to mankind." Whenever a "good scientist" appears in a horror movie to destroy the giant grasshoppers or the beast from 20,000 fathoms, he is always a "practical" scientist—a technician, really—and he is often opposed by the research establishment. The crewcut scientists who eventually conquer the Thing, for example, are hampered by a longhaired theoretician who wants to keep it alive "to find out what it knows." Eventually both he and the Thing are exterminated; Hollywood gives the public the ending it demands.

American scientists have always coexisted with the public in an uneasy symbiosis. Washington and Jefferson both hoped to establish a national endowment for the arts and sciences. But not until the administration of John Quincy Adams, a president aware that he was making a hopeless *dernier cri* for civilization, was a serious effort made. Our most erudite chief executive, Adams was the last of an aristocratic presidential line. He knew that he stood on the threshold of the age of the common man. After Jacksonian democracy drowned his proposals for a national university and an executive department to administer federal aid to the sciences, it took a hundred years and a total war to soften public antagonism toward paying the high costs of scientific research. Following World War II and the mystery revealed at Los Alamos and Hiroshima, scientists became the new high priests. They spoke a language as strange as Latin, they saved bodies instead of souls and, with society's money, they built monuments as expensive as cathedrals. If challenged by recalcitrant congressmen, they responded self-righteously that their work was necessary for a greater future. They had, after all, won the war.

Left-wing scientists endorse the ideal of community control, but in practice they are waiting for the ideal community

When money began to pour into biological research in the 1950s, the justification was the improvement of public health. The discoveries of antibiotics and a polio vaccine were almost as dramatic as a mushroom cloud. The budget of the National Institutes of Health quadrupled between 1950 and 1957, in a process well described in Daniel Greenberg's *The Politics of Pure Science*. Scientists may not have read de Tocqueville, but they had gotten the message: "In aristocratic ages science is more particularly called upon to furnish gratification to the mind; in democracies, to the body." Scientists vowed to gratify the body with a vengeance.

Most biologists, including experimenters with recombinant DNA, can be quite eloquent when asked to describe the potential medical benefits of their work. "Scientists profoundly believe that real benefits to mankind come out of basic research," says Walter Gilbert of Harvard; he talks of a time when bacteria implanted with insulin genes can cheaply and

efficiently spin out insulin in test tubes. (Corporations, including General Electric, Lilly and Hoffmann-LaRoche, are already exploring such possibilities.) The shiniest golden apple is the hope of a cure for cancer. Since cancer is a fundamental disruption of controlled cell growth, any research on the mechanism of cell growth can be said to offer hope for a cancer cure. David Baltimore of MIT points out that even the current NIH regulations may be postponing the magical day of discovery. "Recombinant DNA would allow us to understand the cancer virus," he says, "but containment techniques are such that not much work can be done."

When public criticism becomes severe, researchers like to recall the patron saint of controversial biologists: Louis Pasteur. In 1884 Pasteur's neighbors wrote an angry letter, complaining that a proposed new laboratory "right in the middle of Villeneuve-l'Etang" could easily propagate "a horrible plague impossible to imagine." If their fears had been heeded, modern scientists point out a bit smugly, inoculation against infectious disease might still be a science-fiction fantasy.

After World War II, scientists became the new high priests. They spoke a language as strange as Latin, saved bodies instead of souls and, with society's money, built monuments as expensive as cathedrals

Those who fear a slowdown of their research say the world is moving very fast, new problems appear every day and, if we stop the race of knowledge, we will be overwhelmed. "I think the danger of postponing is as speculatively high as continuing the work," says David Hogness. "We create many new problems through our intelligence. When the problem reaches a certain level, we attempt to solve it. We solve it with more intelligence. If you cut off these ways of solving problems, if you truncate this process, you should know exactly what you're doing."

You see the problem: although scientific work is motivated by curiosity, it must be justified to society. Over the last three decades, as government funding for science increased, the nature of research gradually changed. The struggling experimenter who hooks up wires in his basement is very different from the university professor filling out grant applications to finance a cyclotron. Not everyone thinks that bigger is better. One acerbic soul who yearns for yesterday and rubs his hands gleefully at the plight of recombinant DNA researchers is Erwin Chargaff, a white-haired biochemist whose empirical data provided evidence for the Watson-Crick model of DNA structure. A wit once said that Chargaff's idea of a scientist is Louis Pasteur played by Paul Muni. Chargaff hates molecular biology, and he hates what has happened to science. "If you had a National Music Institute that supported the writing of hundreds of symphonies a year, it would kill music," he says. "Scientific ideas come from heaven, just like melodies came to Mozart." Chargaff would like to turn the clock back, but he is wise enough to know that that won't happen, so he has resigned himself to being a gadfly, biting his adversaries with a sour venom. "It was quite clear that as soon as science was almost completely funded by the government, attempts would be made to push it into so-called useful channels," he says. "Into therapeutic uses, for genetic diseases, a form of eugenics. I am one of the few people who remember that the extermination camps in Germany began as experiments in eugenics. So I am almost congenitally opposed to improving the human lot. It begins with the do-gooders and it ends with the exterminators."

Chargaff fondly remembers the days when "scientists liked to observe nature without trying to change it." He scoffs at the notion that research must run to keep up with new problems. "The idea that science can make a better world is hubris," he says. "We have the arguments that this work is indispensable: we cannot exist without recombinant DNA because otherwise my grandson will die of cancer. I am old enough to remember before there were any cars or airplanes. I can very well imagine how we could live without many things that are now considered indispensable to daily life in America. I could live without genetic research. But since there are geneticists and they must have cigars, we must give it to them."

The bind for geneticists is that to earn their cigars they must prove their work is important; and once people agree, society will want to regulate the work. When J. Robert Oppenheimer remarked that scientists now knew sin, he could not have envisioned all the ramifications of the fall from innocence. Scientists relish their power but shun responsibility. Everyone wants to be a big shot. Michael Crichton captured the sentiment exactly when his scientist hero, summoned from a dinner party to work on a dangerous mission, tells his wife: "You see, I'm suddenly an important person." What whitecoated Walter Mitty doesn't dream of all the paraphernalia of an *Andromeda Strain* fantasy—the pink jumpsuits, red and silver keys, 40-2-5 nutrients and broad-spectrum suppositories? In his reverie, the scientist forgets that the govern-

PHOTOGRAPH BY JOHN PARTIPILO

Robert Sinsheimer: "I think the potential exists for some kind of biological catastrophe."

PHOTOGRAPH BY PETER TATINER

Paul Berg (right) with colleague David Hogness: "Essentially, our work is crawling. This thing is slowed down now."

ment that gives him jumpsuits can also give him guidelines.

Psychological longings and sociological imperatives have led scientists to underline their own importance. However, once the public acknowledges that research is useful and not frivolous, scientists are in trouble. We don't allow politicians or industrialists to police themselves. If scientists are that powerful, the public will think, they should also be regulated. Certainly they shouldn't be allowed to maintain their devil-may-care nonchalance. Oppenheimer defended his Los Alamos work by saying that he was only following political orders. Brecht's Galileo amplified this attitude: "I submit that as scientists we have no business asking what the truth may lead to. . . . I've written a book on the mechanism of the universe, that's all. What people make or don't make of it is no concern of mine." Brecht's first American audience in 1947 had the atomic bomb on its mind, but today's public may also think of genetic engineering. Paul Berg agrees with Galileo. "That's not my job, to worry about that," Berg says. "I can't worry that whatever I do will be used or misused for some malevolent purpose. I think it would be dangerous to try to anticipate where a given line of research is going and then head it off at the pass."

The specter of genetic engineering, with its baggage of test-tube babies and cloned supermen, has frightened humanists even before Aldous Huxley evoked a complete vision in *Brave New World*. That nightmare remains distant. Scientists have lots to do before those days are even possible, and Paul Berg, for one, hopes those days never arrive. But recombinant DNA poses a more immediate threat. "Only very recently have people begun to consider that the pursuit of truth could in itself be dangerous," says Robert Sinsheimer. "Nuclear physics was the first example. Doing an experiment can be a dangerous thing, not just to the experimenter—explorers have always been in danger—but to everyone around him."

Sinsheimer suggests that there should be "an agency for the protection of the future": someone must think about the risks of radioactive wastes, recombinant DNA bacteria and other technological marvels, he argues. Mayor Vellucci began to worry about recombinant DNA after the Walds compared the threat to a nuclear holocaust. That analogy surfaces repeatedly, in private conversations with scientists and at the two public Cambridge meetings. The Atomic Energy Commission, which both initiated and regulated nuclear research, provides a good example of the wrong way to administer science. The people doing the work, who have a vested interest in the progress of the research, should not have the last word on safety.

Although all the facts aren't in on the hazards of recombinant DNA research, the risks appear far more remote than the dangers of nuclear energy. Clearly, modern technology is creating other health hazards that pose a more certain and immediate threat to human life. "I don't like PCBs, I don't like hair dyes—they're a real story that would scare the shit out of you," says James Watson. "But all that the civilized English majors want to talk about is recombinant DNA." The risk of genetic research has captured the popular imagination because it extrapolates so easily into a science-fiction doomsday scenario.

"It is all too big and is happening too fast," says George Wald. It's an appealing lament. Man's scientific knowledge has outdistanced his social wisdom. The recombinant DNA controversy will be useful if it forces people to think about where we are going and what we should make out of our lives and our planet. Our technical capabilities are speeding ahead; our political institutions must struggle to keep up. Otherwise we will increasingly resemble idiots savants, who can multiply ten-digit numbers in seconds but can't find their own way home. ●

Rescued from hunger, war and sex by computers, 10 billion of us will have time on our hands and space in our heads. Whether we fill it with genius, bionic junk or the Tao-Jones averages remains to be seen

NO SWEAT: THE COMING LEISURE

By John Leonard

"Every time the train of history goes around a corner, the thinkers fall off." Karl Marx is supposed to have said that; I haven't been able to track down the quote. I sit in a puddle of words, over two million of them, in books and articles, spilled by thinkers falling all over themselves to see the future. I think I would recognize the future if I saw it, just the way I would recognize an alien intelligence from, say, Andromeda or Sirius: it would look like something I hadn't been able to imagine. I am asked to imagine the future of leisure. For those asked to do such imagining, there never is any leisure, because we are always writing articles instead of combing our alpha waves or romping with the Chimera.

At least one assumption is necessary at the start. It is that in the future there will be enough energy, food, space and time on this planet to sustain a leisure. Let us suppose, then, that the pessimists are wrong and a futurologist like John McHale is right. Damn the exponential curves and full speed ahead.

According to Mr. McHale, people aren't fruit flies. In the past, those exponential curves have flattened out into "take-off plateaus" for human intervention. Besides which, technology has so accelerated change that past curves can't predict the future. A "social telesis" based on information input,feedback and self-correction will save us, if we can agree on our goals and do some integrated planning.

I would like to believe this, at the very least because it encourages me to go on with this article. McHale suggests that efficient new methods of energy conversion are available. Microbial colonies and biosynthetic combinations of bacteria, algae and turnips are among potential new food sources. Man in space represents (1) a heartening convergence of different disciplines on a single task, showing what we can do when we want to; (2) an escape from our biospheric envelope and a probable escape from global interdependence; and (3) a model, with the portable "earth environment," of a self-cycling, self-sustaining, waste-reprocessing "closed ecological system," under human control, with consequences for city planning, health management and integrated design. Our children, the computers, will rescue our fallible decision makers and release the rest of us into a revitalizing leisure—no longer laborslaves, but service-demanding consumers and, in Marshall McLuhan's phrase, "nomads of knowledge."

Herman Kahn has lately taken to sounding almost as cheerful as Mr. McHale. The population explosion, he says, is an aberrant blip on an otherwise level 8,000-year line; to extrapolate from the tip of the blip is as silly as predicting the size of an adult on the basis of the growth rate of a 14-year-old boy. Desalinization will enable us to harvest the entire Chilean-Peruvian coastal plain. Hydroponics and single-cell protein analogues of beef and chicken will be other food sources. Liquefied coal, shale oil and tar sands, solar energy bioconversion and big nuclear "reservations" will take care of fuel. "We see no reason," Mr. Kahn told *New York* magazine, "why the world should not be able to support a population of 30 billion people with per capita earnings of $20,000 and with all the energy, raw materials, and food they need"—except mercury and chromium.

So much for the Club of Rome and its doomsaying, doomsdaying projections.

And since most of those 30 billion people are going to be working a three-day week, they'll have a lot of time on their hands and space in their heads: leisure.

First, then, consider the home, or "living center." It will be pretty much as E.M. Forster imagined it back in 1911, in a short story called "The Machine Stops"; that is, a combination of cocoon and communications module, somewhere

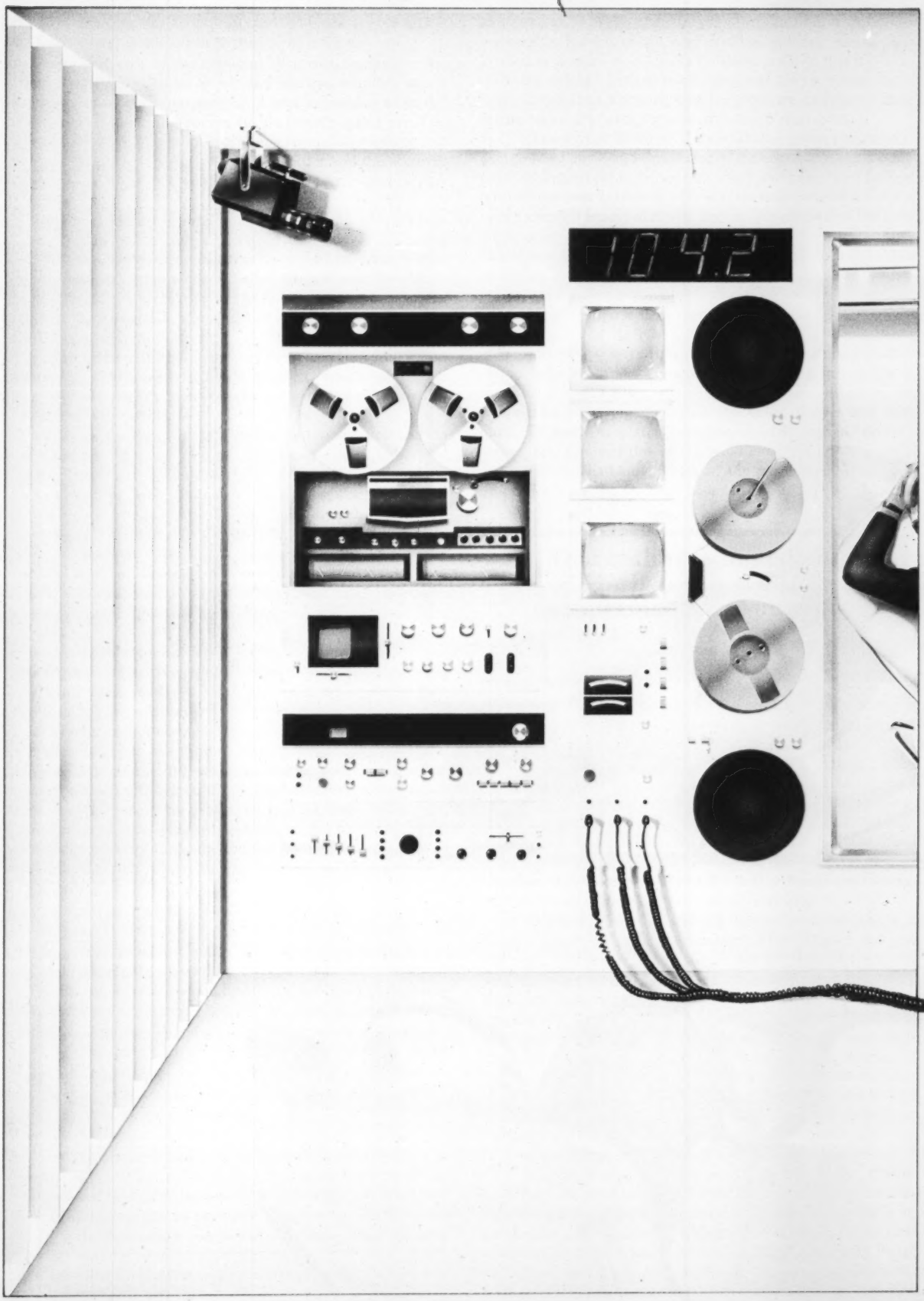

ILLUSTRATION BY DICKRAN PALULIAN

in one of Buckminster Fuller's tetrahedral cities, from which it isn't necessary, much less desirable, to ever leave.

This cocoon will be managed by its own computer. The technology already exists to put one into every home, with a keyboard to do the programming, a microprocessor to do the work and a monitoring screen to see what's going on. The computer will take care of everything from dish washing and accounts keeping to the video-disc recorder and the security patrol, whether or not you are around in your sweaty particularity.

When you are around, you can play with your picture phone or your voice-activated typewriter, your wraparound 3-D TV screen or your neon sculpture, your biofeedback console or your holography box. You are plugged into the library and an electronic archive; you can punch up a book or magazine, or dial a program. You might even hook yourself up, like the inventor Remo Saraceni, to a "stethoscoped stereo system" and listen to the boom of your brain or watch your blood pump. Or, if you are bored with yourself, stick a multigame cartridge into the brain of your TV set and play chess or tic-tac-toe, or just doodle.

If, on the other hand, you are ambitious, you can do some serious "drawing" on the cathode-ray tube, something like Charles Csuri's "Hummingbird" with 14,000 modulations on one form, or John Whitney's "Matrix" of lines and cubes choreographed by mathematical formula, or Siah Armajani's remarkable "To Perceive 10,000 Different Squares in 6 Minutes, 55 Seconds," or the endlessly swooping line of the "Black Star" of Leonard Kilian and Campion Kulczynski. And if not computer art, why not computer music? Sit down and fragment a vibration by fiddling with real time and pure acoustics.

But you are tired. It's real time to take off your disposable clothes and go to water bed, where, while you sleep, you will learn Chinese—by what Aldous Huxley in *Brave New World* called "hypnopaedia"—or program a sex dream.

I have mentioned sex. You will have wondered whatever happened to one of our more popular leisure-time activities. Long ago, of course, it lost its procreative function. The reservoirs of the future are as full of contraceptives as they are of fluorides. Sex, then, for pleasure? It is no longer necessary. Stimulation of the "pleasure center" of the brain, via scalp electrodes (exactly the same method by which experimental psychologists induce nervous breakdowns in laboratory rats) allows for ecstasy and privacy at the same time, swoon and spasm, spurt and *schmerz*, at designated intervals of variable durations. You program the computer for an orgasmic zap, just as you program it to start the coffee perking in the morning, and no one need ever know. Except the memory bank.

For noncarnal communication with friends and associates, there is the picture phone. E.M. Forster objected that picture phones were indistinct and left out emotional nuances, but E.M. Forster was innocent of the industrial color video projector, a spewer of images more distinct than most of us can tolerate; he was equally innocent of electromyography, by which an oscilloscope visualizes moods, even when your friend isn't talking.

What about talking to your parents or your children in person, just for the tactile nimbus that reassures you of the continuity of flesh, that argues (against Arthur C. Clarke) that you are more than just a disposable container for DNA?

Well, if you have old-fashioned parents, they will long ago have been furloughed to the funny farm and their own mysterious leisure of playing shuffleboard and eating figs. While the modern world waits for them to die so that it can reclaim the calcium in their bones and teeth for recycling, there is the comfort of knowing that the pleasure centers of their feeble brains are being stimulated by scalp electrodes.

As for your children: if the state has given you permission to have any—and this is one of the variables only a computer is competent to factor out—they will have been farmed out on two-year contracts to one commune or another, for a very extended family life, with options for renewal of the contract on both sides of the generation gap: a sort of rent-a-child, like Hertz, with the car getting a chance every once in a while to reject a driver. Doubtless, they have cassettes—holograms—to remember you by.

Which is more than they probably want. Interface it: the best years of their lives were spent in the sperm bank. You—and, if you were romantic, another consenting adult—shopped for them at a commissary. Like packages of flower seeds or frozen cutlets, their ingredients were listed on the wrapper: gender, pigment, size, IQ, color of eyes and hair, music or math or batting average, Jewish orphan, doesn't snore. You dropped this one-day-old embryo off at the artificial womb for hatching. Think of the psychoanalysts unemployed because the Oedipus complex is obsolete. Disposable trauma.

Your children's ingredients will be listed on the sperm wrapper: gender, pigment, IQ, batting average, Jewish orphan, doesn't snore

You must understand that the purpose of technology is to make life easier for you, to expand your availability to the lures of leisure. No blood, no pain, no birth, no death.

That's right, you may never die. What hasn't been transplanted from an accident that wouldn't have happened if everybody had stayed in their living centers is made out of nylon and plywood and semiconductors, Dacron and carbohydrates, dimethylaminoethanol and powdered platinum. And even should this amalgam of the sacred and the profane malfunction, they'll keep you alive in a tent or freeze your reticular formations. Enjoy yourself—keep throbbing.

What if, inside your living center, you experience a sudden attack of the discrepancies? Play fatigues and the rhapsodic attenuates; the analogue doesn't taste like oysters, and you want to slug somebody in the armpit or the pineal gland, and last night you dreamed of a microprocessor doing unspeakable things to a hologram while the picture phone was watching. Discrepancies, once perceived, lead to metaphysics, which are messy. *Why am I*? There are drugs to obscure this question: sneeze your mind. The gas of *like wow* expands to fill a vacuum of the will or meaning, but thinly, at a loss of coherence: like wow *what*? One lacks mass and definition; one merely grooves.

Leisure may be a bad idea. Certainly leisure suits are.

I know, I know: as Herman Kahn might burble, the cocoon isn't the only scenario. Could be, rather than desalinizing the coastal plains of Chile-Peru,we'll play Frisbee there instead. Could be, instead of dialing a dream, we'll devote ourselves to clockless, timeless games, like tag and Ping-Pong; we'll bowl, bat, climb, kite, surf, sail, swim, skate. Could be, we'll group and groove on earth and water and wind and rock

John Leonard is the chief cultural correspondent for the New York Times.

(the mineral, not the music), and coordinate. Perhaps even now, down at the ashram, three polymorphs are looking for a fourth for sex.

Could be, too, that at a be-in (via a battery-driven, no-lead electric car or a moving belt of highway) we'll dissolve discrepancy in solvents of what Dr. Robert Ornstein calls "tantrum yoga," in the quickie therapies of TM or Arica or pop Zen or Werner Erhard or L. Ron Hubbard, in the bathtubs of Esalen, in the Tao-Jones averages. Genital organization is such a drag. Language is guilty of association with rational comment and abstract ideas. Relief is just a shallow away. If who we are and what we might or should have been seem out of sync, change the channel. Om.

Could be, finally, that all this leisure is going to uplift us. When we consult the electronic archives, it will be to retrieve information about the golden mean and the Shakespeare gusto, about the Ibsen anger and the Beckett ambiguity and what it feels like to listen to Beethoven's last quartets or to be nailed to a cross. McLuhan would then be right: "Now that the environment itself has become a major teaching machine, the image of learning has been reversed. The learner becomes hunter, explorer, not consumer." We would seek refinement in our trailer-campers, land yachts and living centers, our geodesic domes and our fragmented vibrations and our stethoscoped stereo systems. We would groom, with a wire brush, our notions of art, science and God.

Won't be, I think. Our love affair with machines (they don't talk back, except to say go/no go), and with technological and pharmaceutical fixes, is such that it won't occur to us to wonder whether cyborgs have souls. At least we are stimulated. The rest is marginalia, footnotes. We are liberated from our parents, our children, our lovers, our friends, danger, luck, touch, fear, mystery, sin, accountability, epistemological quibbles. We are at leisure, a big space. Instead of filling it up with genius, we will fill it with toys. Genius, anyway, is insupportable: it makes us feel sad, or bad, or different; it suggests a scale by which we might be measured. How much more satisfying, with the help of our computer chips, to be our own geniuses, playing with the walls of our rooms or the oxygen flow to our brains, beyond criticism. Not hunters, explorers or nomads of knowledge, but bionic junkies.

It's not even safe to go into our parks at night, and we talk about Jerusalem, Babylon, Atlantis.

One would hope, in leisure, to be wise, perhaps to recover that sense of the self—the duration and intensity of a single human life as the measure of all things—that was the secret of the Greeks. By this, the Greeks didn't mean cutting things down until they fit us, or filtering things out if they bother us, or changing our consciousness as if it were a suit of clothes or a pair of shoes. The Greeks weren't tourists in their own lives.

To quote a Roman, Seneca: "Who has more leisure than a worm?"

While we are behind the locked doors of our living centers, protected by laser beams, buying and voting and going to high school by telephone, admiring as art the projections on the ceiling of our own electroencephalograms; and while, overhead, a star fleet of communications satellites weaves a seamless web of information and distraction, somewhere out there in the interstices of the ad-man consumer grid, in the flab of affluence, the Indians are waiting, with the belt buckles and the wind chimes and the shawls and the poems that they made all by themselves, with their own hands. And when the machine stops, as E.M. Forster knew it would, what they have made will be all that is left, all that is real. The big leisure is death. ●

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Meet six amazing members of the 21-and-under crowd. They're all people to watch – or to watch out for

WHIZ KIDS

By Ruth Rosenbaum

MICHAEL LORD, JR.: CHILD EVANGELIST

"Amens" and "Praise the Lords" crescendo from the audience; onstage the "miracle line" forms around a diminutive figure dressed in a gold-bordered white suit. As the preacher lays hands on them, several people swoon, a man falls to the floor, limbs jerking, and a woman floats up from her wheelchair screaming "Hallelujah!"

Since his career began when he was five, Michael Lord Jr., the star of this eyewitness account, has reached 70 million people in person or on television and has traveled about 100,000 miles a year through the United States, Canada and Mexico, preaching and healing.

At his home base, Colombus, Georgia, Michael, now nine years old, receives about 30 letters a day, mostly prayer requests from sick people or their relatives. He prays over each one, while his secretary handles the mundane chore of writing replies. Many people who have never met Michael claim they have been cured by mail.

"God spoke to me when I was two," Michael said, over a late breakfast of Coca-Cola. "Just like you're speaking to me right now." God now communicates to Michael through "x-ray pictures" that show him what is wrong with people so he can heal them.

When I asked Michael how he heals people, he answered a bit arrogantly, as if I should have known better, "*I* don't heal, I just pray, and *God* heals." He who is not cured within a few weeks after Michael's touch "doesn't believe in the power of the Lord."

Mrs. Lord, a gospel singer, told me that Michael spoke at a very early age. His first sentence was "Mother, I want to go live with Jesus."

"He never did anything childlike, well, except to call his 'behind' his 'neighborhood.'" Michael showed amazing aptitude for recalling songs after hearing them only once, and made his church singing debut at the age of 24 months, when he unexpectedly joined his mother at the microphone and sang in perfect pitch. When he was two and a half, Michael was invited by Lester Maddox to conduct a prayer breakfast at which the Georgia governor proclaimed him the "Ambassador of Goodwill for the state of Georgia." Michael began creating his own songs — music and words — when he was four and released a record when he was eight.

Michael's father, the fourteenth in his family to take up God's calling, didn't object to the singing, but when Michael began to plead to be permitted to preach — "to tell people about Jesus" — Michael Lord Sr. drew the line. "I think my Dad wanted me to have an easier life, like a doctor or a lawyer," explained Michael. Eventually Mr. Lord would have to recognize the will of God. Perhaps it happened the day when Michael, five years old, laid hands on his grandmother. She'd been unable to walk for eight years due to a stroke, but at Michael's touch she rose and walked, and has been able to since.

Michael preaches with a dramatic alternation of shouts and whispers, and uses parables and stories he learns from a children's book about the Bible, all without a trace of self-consciousness. As he puts it, "I've never been nervous in my whole life." When I asked him why he thought God had chosen him as his vehicle, he answered without a second's hesitation, "I guess He thought I could handle it."

Mary Hartman, Mary Hartman, which featured Jimmy Joe Jeeter, an eight-year-old evangelist, and his lecherous father, is a topic of interest in the Lord family. A phone conversation with one of Norman Lear's staff members confirmed the Lords' suspicions that Michael gave them the idea for Jimmy Joe. Though the Lords were reassured that details of the Jimmy Joe episodes were not based on the Lords' family life, Mrs. Lord seems intent on denying any similarity point by point.

"You know, Jimmy Joe died when the TV fell into his bath water. Now, that's just stupid. Michael knows that's dangerous — he would never do that. And Jimmy Joe's father — my husband is nothing like that, you can ask anyone."

Just when Mrs. Lord seemed to have reassured herself, Michael spoke up ingenuously: "But you know what, Mother? If I go somewhere with Dad and there are women interviewers or secretaries, when they see Dad with me they back off and keep their distance."

While Michael's parents want him to live as normal a life as possible, there are those clergymen who have chided Michael for reading comic books — and especially for men-

PHOTOGRAPH BY JAMES JOERN

tioning it on national TV. For that reason, other equally innocent pastimes Michael enjoys will remain unmentioned here. But he makes his more secular philosophy quite clear: "I don't think God expects you to walk around all the time with a halo over your head." Michael doesn't hide the fact he has girlfriends in several "church-stops" across the country. How many? "I'd really rather not count them now, ma'am."

CRAIG MYERS: THE YOUNGEST MAYOR

When Craig Myers decided to run, he just spread the word around town. At 18, without a campaign, he was elected mayor of Liberty Center, Ohio (population 1,007), by a seven-vote margin.

"Everybody was complaining about what my opponent [an incumbent] was doing and what he wasn't doing. People wanted a change, and I figured they'd vote for me, so I ran against him."

Craig, now 19, speaks about himself with an easy balance of off-handed modesty and self-assurance. With only his high school political science course as background, the youngest mayor in the country took office last January, and has already come to terms with the chief problems left unsolved by his predecessor.

"We've finally got the sewer system off the ground; we're starting construction next year. My predecessor was only playing around with it, spending a lot of money moving engineers about from one location to another without ever deciding on a main site. Our next project will be fixing the water. Have you ever drunk sulphur water? That's what we have. We're discussing whether to have a reservoir or a treatment plant out to the river. But of course, once we put the sewer in we're not going to have the money to do anything else. It's pretty depressing."

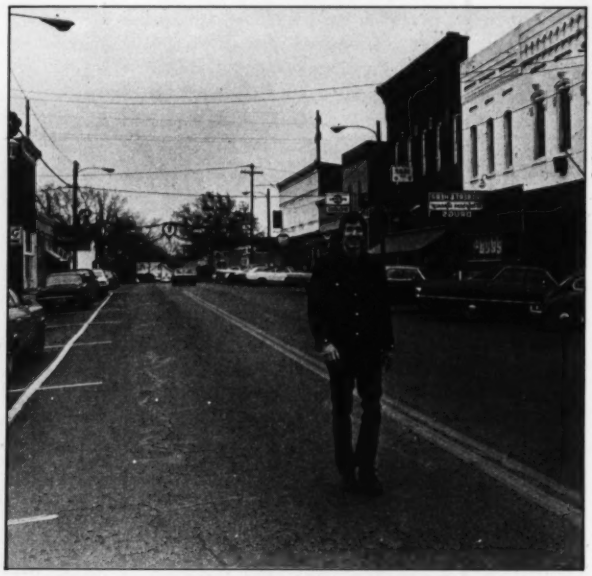
It was early one afternoon that I first tried to contact Craig. A woman's voice asked me if I could call back after 5 p.m., adding, "The mayor sleeps during the day." I figured he must be younger than I'd been told.

Actually Craig works a seven-hour shift four nights a week at a Campbell Soup factory, operating a machine that presses can lids out of sheet metal. "I really don't like the job — I'm not a factory type," Craig says. But politics pays him only $1,200 a year, while soup pays $12,000. "Being mayor is only a part-time job, but sometimes there are meetings all day. Some days I can sleep, but if someone calls, I get up and answer the phone, and if it's important, I get dressed and go."

Craig feels "the ecology people" are one of the biggest menaces to a town like Liberty Center. "They're making us broke. I don't mind some regulations, but once they tell you what they want, they should quit coming back and changing it. We had plans for the sewer system all ready to go, everything was OK'd, and then this EPA comes in and adds a stipulation. So we go and redo the whole thing, submit the plans again, only to find they've added a new stipulation."

Since Craig's staff is limited (there are only four on the payroll — a clerk, a utilities and maintenance supervisor, his assistant and a policeman), he seeks advice from attorneys and officials on the state level.

Next year, while he continues to run Liberty City and



PHOTOGRAPH BY LUKE BLACK

the Campbell can lid machine, Craig will study political science at Bowling Green College. "I think I better go to school first before I run for another office."

BECKY SCHROEDER: PRETEEN INVENTOR

NASA has been keeping tabs on Becky Schroeder for some four years now. When the first official inquiry arrived at Becky's home in Toledo, Ohio, she was only 10. Her parents wrote back: No, Becky is not under government contract; no, she has never worked on NASA premises.

It seems that NASA had heard about an invention of Becky's, thought it could be useful on future space flights and wanted to claim ownership of the patent. That first invention was a luminescent backing sheet that makes the top page of a stack of papers, as well as black guiding lines, visible in the dark. Becky's four following patents (she's just turned 15) also involve seeing in the dark. NASA, still hoping to take over, has been in touch again.

"I never thought I'd be an inventor," Becky told me in a soft, shyish voice. Neither did her parents. Her father (a patent attorney who handles the practical side of his daughter's

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creations) still wonders "how a 10-year-old could have known that the luminescent backing sheet needed to be activated by a 10-second exposure to real light," or "how she got the idea to make black visible in the dark."

In this case, mother necessitated invention.

"I was waiting in the car for my mother outside a shopping center," Becky recalls. "She was taking a long time, so I started my homework. When it got dark, I was really mad because I couldn't keep writing."

Mr. Schroeder didn't take Becky's idea of glowing paper seriously, but nevertheless he bought her some luminescent paint to play around with. A few weeks later he was contacting the patent office.

After her intuitive breakthrough, Becky began studying the science of light and improved on her first brilliant invention with two more. Her fourth and fifth inventions both use a battery to trigger phosphorescence. One is a night strip that can glow for eight hours; the other a flashy memo pad—"great for writing in the movies." Becky is now working on something new, totally unrelated to light, which she can't yet talk about.

"I don't really have to think about inventing," she says. "Things come to me just right out of my head. I'll notice how something can be improved, something that's missing. Like when we go to a restaurant, sometimes it's so dark I can't even read the menu. So I thought of a way of making menu letters glow in the dark. Lots of times, I don't talk about my ideas because I don't think they're important enough."

Already Becky's ideas are important not only to NASA, but also to some large companies that have shown interest in marketing her inventions. "They're a little expensive for the current market," Mr. Schroeder says, "but one large corporation indicated that it won't matter because there's nothing else out yet that's like them."

Though Becky turned out five patentable inventions between the ages of 10 and 14, she's not a driving, ambitious person. "She moves at her pace," her father says. "You can't make her move faster; she just doesn't feel the pressure of time."

Besides finding time for inventing, schoolwork, guitar, tennis, swimming and volunteering at a nearby wildlife preserve, Becky has just begun research on how light affects the biological activity of animals and people.

"It won't be patentable, of course," said her father, "but it could be very significant work."

DAVID TOURETZKY: COMPUTER EXECUTIVE

Just before the 10 p.m. news, when the unsettling voice asks, "Do you know where your children are?" Simeon and Harriet Touretzky of Edison, New Jersey, listen gratefully to the familiar hum-and-clacking coming from their son David's bedroom. Until recently, David's foremost passion had kept him away from home much of the time. Now, with a computer terminal at his bedside, 17-year-old David can devote time to his family and his overwhelming interest in computer science.

"It's what I always wanted," said David, a sophomore at Rutgers University — "always" meaning since he was 12.

"At that time, I was in the seventh grade; I was interested in anything I could get my hands on, and I happened to find a book on computers that was easy to understand — that got me started."

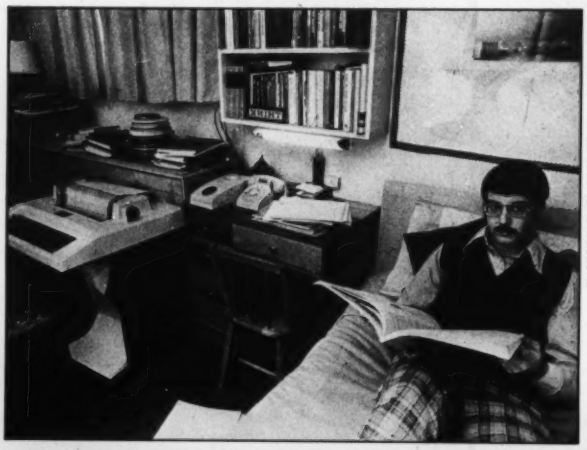
Frustrated by the attitude of authorities at the private school he attended ("They banned me from the computer room for a while just because I was late to class twice after using the computer"), David, then 14, began attending courses on the side at Rutgers University. He was soon told he should skip the basic computer courses and go on to the more advanced. When news of this particularly gifted computer addict reached the New Jersey Educational Computer Network (ECN — a nonprofit organization serving the state's higher-education institutions), they offered him a job.

David, still 14, found himself teaching corporate executives and college professors about programming. The same year he wrote the first of two manuals on programming that are now used at various colleges in New Jersey. At 15, he was a part-time consultant to Lippincott Publishers and Phillips Data Systems.

David is now a partner and vice-president of research and development at Innovative Systems, Inc., which sells computer time and special programmed systems to business and industry.

In his spare time, David plays computer chess, creates graphic art with a computer (both according to programs he devised himself)and plays "Star Trek"—"The computer prints a map of the galaxies; you're the captain of the Enterprise and there are Klingons firing at you, self-destruct methods, star bases, time warps. . . . "

As for the future, David wants to do research in artifi-



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cial intelligence (AI). He told me excitedly about a game called "Parry," short for paranoid. In this game, a real person is a paranoid computer's psychiatrist. In an experiment, David told me, hundreds of psychiatrists sat at computer terminals and "spoke" with either a bona fide paranoid or a computer, without knowing which. "Fifty percent thought the computer was more paranoid than the human being, 50 percent didn't—which means that it was indistinguishable."

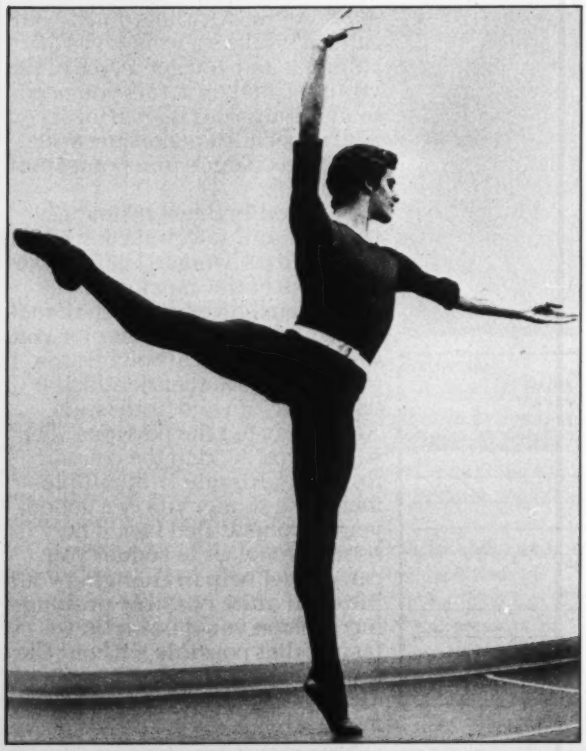
"The problem I'm having now is knowing enough about how people think to program it into a computer. I took a course in the Psychology of Thinking. I hoped I could go in and learn how people think and, great, program it up and I'd have AI. But if the psychologists don't know it we can't program it."

David speaks with a trace of scorn about people who worry about the abstract danger of artificial intelligence. "There are people running around telling everyone that computers are dangerous, that it's wrong to program this, wrong to program that. I disagree. I think that anything that can change people's way of thinking is great. Many people feel, 'Well, we can think, so we're divine.' If you can build a machine that can think, like a robot that doesn't have to be remote-controlled by people, you can force people to reexamine their definition of humanity and humanness."

2001? David thinks that the degree of technology portrayed in Kubrick's movie is not far off. "I hope it doesn't get to the point where we have murderous machines," he said. But is it possible? "Oh yeah, sure, anything is possible with artificial intelligence."

FERNANDO BUJONES: DANCER EXTRAORDINAIRE

When Rudolph Nureyev fell sick with pneumonia before a performance in L.A. last January, he is reported to have said, "Get Fernando." Shortly after, Mikhail Baryshnikov, the widely acclaimed Russian dancer who defected to the U.S., was injured just before a sold-out performance for the Canadian National Ballet. The company sent for Fernando. Immediately after four days of performing in Toronto, Fernando was whisked to San Francisco to replace another injured Russian, Valery Panov.



At 21, with at least seven more years before he will have reached his peak, Fernando Bujones is already considered by many to be America's greatest dancer.

Shortly before he became the principal dancer in the American Ballet Theater, Fernando, at 19, achieved something that no other native-born American dancer ever has: he won the Varna competition in Bulgaria and brought home the gold medal.

"It was the first time I ever felt nervousness before a performance," Fernando told me. "Fortunately, my cousin had prepared me psychologically and I snapped out of it. She'd told me to keep thinking I was the best, that I would win. It was very important; one second of doubt or fear on the stage and I would have lost."

Zeida Mendez, Fernando's cousin and coach, says proudly that older and more experienced dancers shy away from some of the pieces Fernando performs superbly. "Even the easier pieces Fernando dances are more difficult than what everyone else does, because he choreographs his variations in a much harder way. No one else has even attempted to do some of the steps he does."

Fernando's self-confidence and immense enjoyment of dancing, so evident when he performs, are probably responsible for the excitement he generates in audiences. He becomes an instrument of the dance, rather than an artist consciously projecting his art.

Part of his ease is due to his near-perfect classical technique, which even Nureyev has publicly praised. Fernando says he must now develop the artistic side of his performance. "I'm working on it every day; it's only a matter of time. Some critics compare me with really mature, older dancers in terms of artistry, as if I should have everything right now. They forget I am 21 years old and that I have not stopped learning."

Fernando's career began with a lack of appetite. "I was impossible; I wouldn't eat anything and my mother began to get desperate." When a psychiatrist suggested to Fernando's mother that he needed exercise to regain his appetite, she enrolled him in Alicia Alonso's dancing school in Cuba. (Though born in Miami, Florida, Fernando spent most of his childhood in Cuba, his parents' native country.)

He first considered becoming a professional dancer after receiving a scholarship from the School of American Ballet when he was 12, and at 17 he joined the American Ballet Theater.

In the past two years critics have focused on Fernando's personality — labeling him "arrogant," "cocksure," the "bad boy of American ballet." The only reason seems to be his open admission that he is a great dancer, that he is beginning to achieve what he's been working for, and that, on his return from Varna with the gold medal, he was disappointed when Baryshnikov's defection deflected publicity away from him.

"There are a lot of people who don't understand me," Fernando said, appearing more like a shy schoolboy than an arrogant bad boy. "When someone is outspoken and honest, they call him arrogant. Honesty seems to hurt people. Besides, if I start feeling less skilled, less confident on the stage, I won't be giving the audience the best performance I can. And that's my job, isn't it?"

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JOHN PHILLIPS: HIS PHYSICS PROJECT WAS AN ATOM BOMB

When John Aristotle Phillips went to check if he'd flunked his physics project (after a month's silence from his professor), he was told that the government had his paper and was considering giving it classified status. Apparently John's blueprint for an atomic bomb, more than half as powerful as the one that destroyed Hiroshima, was right on target.

Petite enough to fit inside the trunk of a car, and quite economical (the materials, excluding plutonium, would cost about $2,000), the bomb, says John, was not so difficult to design. "Any determined terrorist with a basic understanding of physics could do what I did." That was the main reason that John, then 20 and a junior at Princeton, undertook the atomic challenge. "I wanted to draw attention to the issue of safeguarding nuclear materials. My belief is that the U.S. doesn't use enough discretion in the procedures used to transport and store the materials." With a bit of stolen plutonium (John's bomb requires 15 pounds), a terrorist could build himself a bomb and play an endless game of nuclear blackmail.

"Billions of dollars and years of research are no longer required for the design of a Pu-239 fission bomb," John told me. It took him just under five months. Almost all the references John used—there were about 25—are available to the public in physics and engineering libraries; the other two, "The Los Alamos Primer" and "Manhattan District History, Project Y," came from the U.S. Government Printing Office.

John's physics adviser, who'd worked at Los Alamos, bent over backwards *not* to reveal any classified information for fear of endangering his national security clearance. "He merely directed me to a couple of books and told me when I got off the track," John affirmed.

After the research, he had only to fill in one missing link — how to arrange the explosives to achieve a supercritical mass and detonate the bomb. That was highly classified.

"I made a conceptual guess," John said. "I had a flash, and it turned out to be right. It was profoundly simple once I saw it, and someone else with determination could see it too."

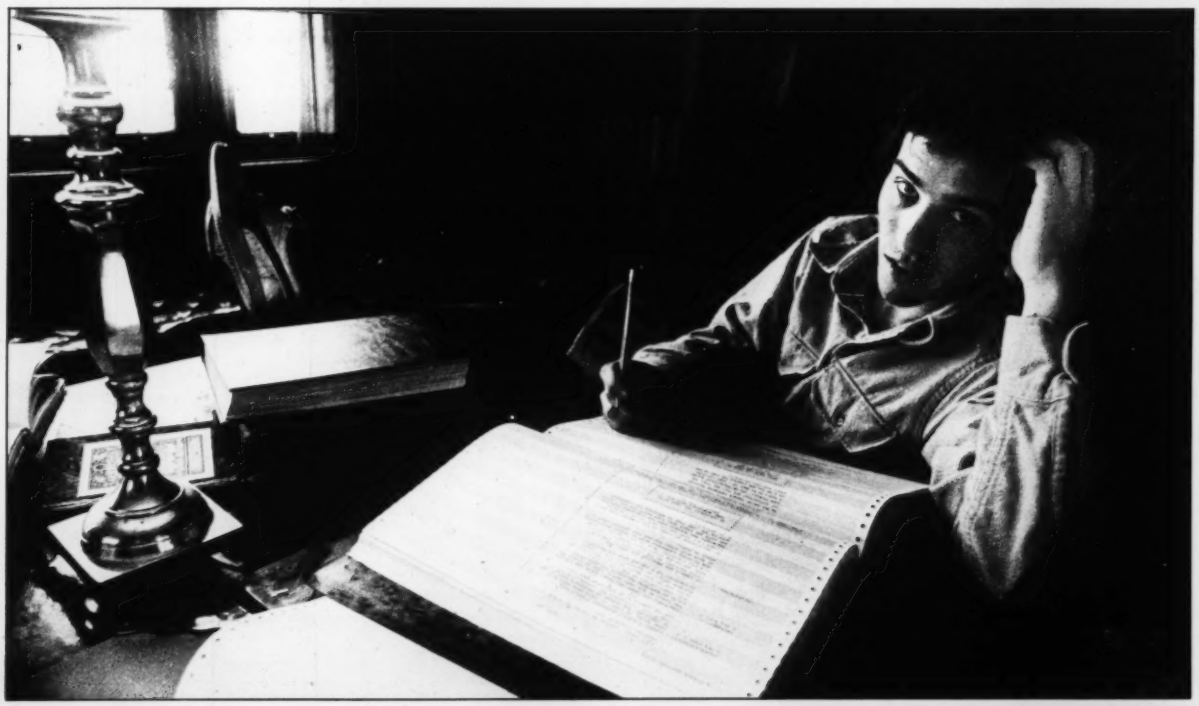
More immediately frightening to Phillips' family than a determined terrorist is a lazy one, who would find it more profoundly simple to "recruit" someone like John as a consultant. "We did consider the kidnap possibility," he says, "and it took a while before my parents, my professors and I decided to give in to reporters who somehow got wind of my paper. If I've drawn attention to the safeguard problem, if this has in any way helped deter a real bomb from going off in a place like Manhattan and killing a million people in a 10-millionth of a second, then my purpose has been achieved."

In fact, while John is disturbed by strange letters and midnight callers who ask for him and hang up as soon as he responds, his project has, perhaps, already had positive effects. Within a few weeks after he went public this past September, France announced its new willingness to cooperate with the U.S. to establish tighter safeguards in the sale of reprocessing plants and in mid-November offered Pakistan an easy way out of a sales contract signed last spring.

John would like to think his project has something to do with it: "I got a call from the French Embassy in Washington. They wanted my paper, which of course I couldn't give them. But they did say it was brought up as an important subject in the controversy over whether to sell more reprocessing plants and nuclear technology."

Now 21, John is completing his major in aerospace science, hoping eventually to become an astronaut. He expects a patent soon on a motorcycle-crash protection device he invented. He's also the Princeton Tiger at football games, runs Aristotle's Campus Pizza Delivery (his own creation, grossing about $1,500 a week) and is busy trying to choose among several exciting job offers that followed his explosive fame.

And his paper? The U.S. government finally did not classify it because of a sort of "Catch-22," but his professors locked it up after removing a key page. ●



PHOTOGRAPH BY GREG GENDALL/TRENTON TIMES

Science-fiction movies have almost never been meant as serious blueprints for the future. Instead, they've explored our phobias with dazzling special effects

FUTURE IMPERFECT

By Richard Corliss

In 1940 a state of hostility existed between America and the "Eurasian states."[1] A war was then averted only when the president of the United Nations killed a leader of one of the blocs.[2] In 1964 World War III broke out,[3] and two years later a "Wandering Sickness" swept Europe, its victims compelled to walk aimlessly until they died of exhaustion.[4] The plague never reached Poland, for in 1970 its scientists colonized Venus.[5] But then, in November 1976, the germ warfare between China and the Soviet Union spread its contamination throughout the world, and it seemed that the only American left alive was—Charlton Heston.[6]

In the movies nostalgia pervades everything, even the future. Remember when you were a little kid screaming as you watched *The War of the Worlds*? Remember when you were an older kid getting stoned as you watched *2001*? Now look back at the prophesies made by the science-fiction movies of your youth—and before, back to the 1902 *A Trip to the Moon*, with the first landing party discovering some stellar cuties who bear a striking resemblance to chorines from the Folies Bergère. These films seem pretty naive now: a little more adventurous than the Rand Corporation's predictions, a little less accurate than Jeane Dixon's.

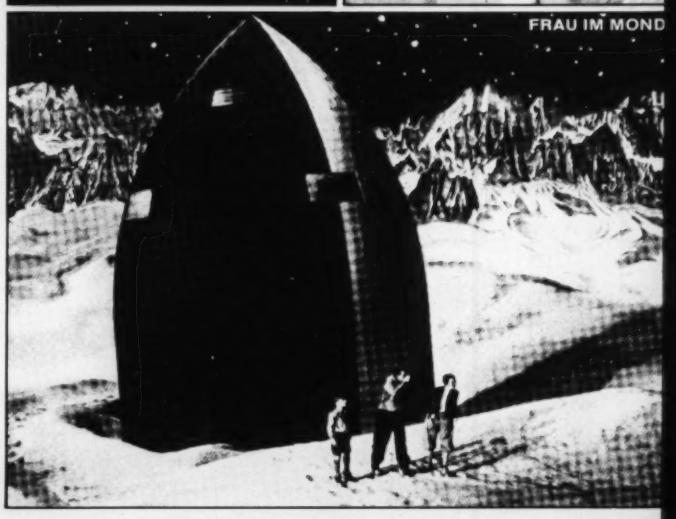
In fact, many SF movies look like splashy cinematic equivalents of the year-end forecasts that appear in the *National Enquirer*, that tabloid meeting place of seers and seersuckers. Too often SF movies simply bastardize the concerns of early SF literature, the speculative fiction of Jules Verne, H.G. Wells and Edgar Rice Burroughs. It was not ever thus. Fritz Lang's *Metropolis* (1927) pictured an automated, underground society in the year 2000; and in *Woman in the Moon* (1929), Lang and scientist Hermann Oberth invented the rocket "countdown" that mission controls have been using ever since. But most SF movies, especially the rash of Armageddon fantasies made in the fifties, weren't meant seriously as blueprints for the future. They were supposed to be reflections of that Cold War present—a persecution complex dressed up in a Martian spacesuit. And they were supposed to scare the hell out of you.

Although some distinguished filmmakers have flexed their muscles in SF (notably Lang, Jean-Luc Godard, François Truffaut, Howard Hawks, John Boorman and—a few bars of *Thus Spake Zarathustra*, please—Stanley Kubrick), the genre has attracted mostly bargain-basement directors. At

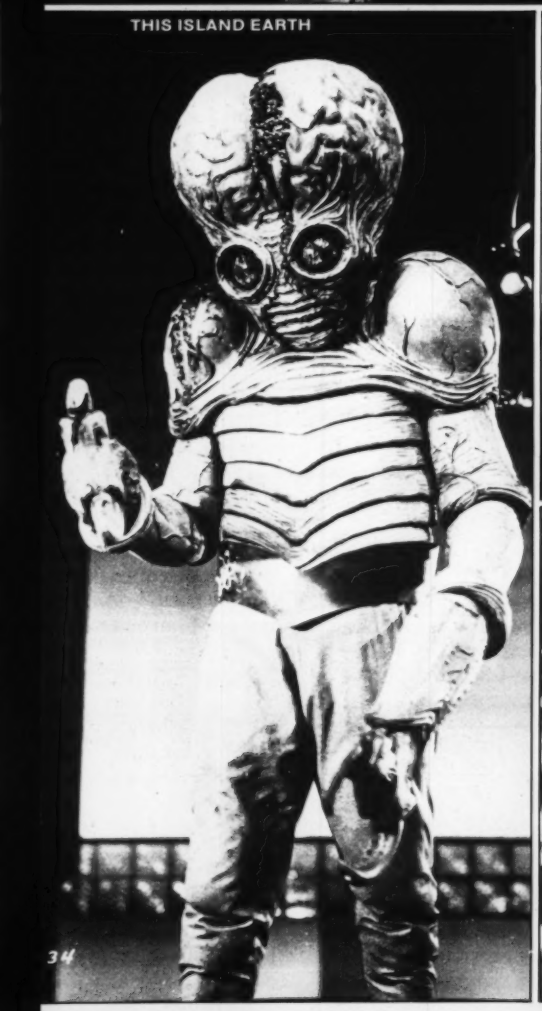
TRIP TO THE MOON

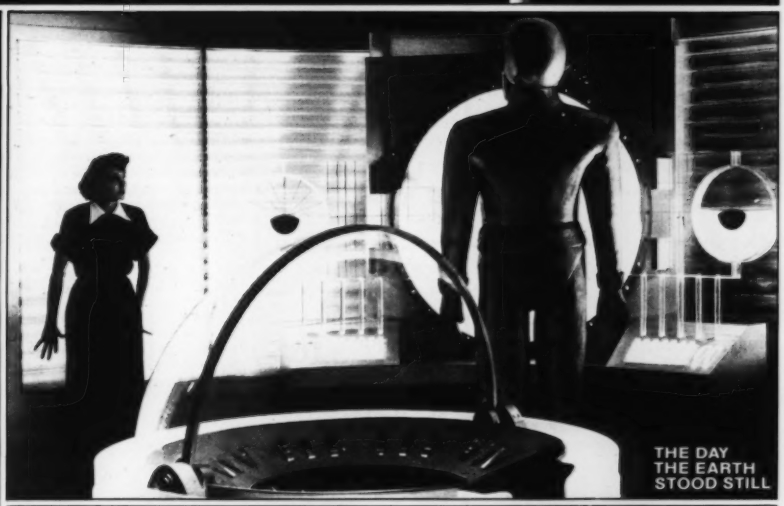
METROPOLIS

CREATURE FROM THE BLACK LAGOON


FRAU IM MOND

1. *Men Must Fight* (1933). 2. *High Treason* (1929). 3. *On the Beach* (1959). 4. *Things to Come* (1936). 5. *First Spaceship on Venus (1958)*. 6. *The Omega Man* (1971).





PHOTOGRAPHS FROM THE MUSEUM OF MODERN ART FILM STILLS ARCHIVE

SF STOCK CHARACTERS

THE HERO

He's usually some kind of scientist: physicist (Gene Barry in *War of the Worlds*), electrical engineer (Rex Reason in *This Island Earth*), amateur astronomer (Richard Carlson in *It Came from Outer Space*). Hallmarks: curiosity and humanism. Can cogitate if pressed (in which case Gene Barry puts on his glasses, Richard Carlson puffs on his pipe and massages the elbow patches on his tweed jacket). Is often mistaken for paranoid. Has an unerring instinct for telling whether the aliens are friendly or hostile. His scientific prowess is validated by being able to meet the aliens head-on; his humanism is validated by winning the heart of his leading lady.

THE HEROINE

Scientist or scientist's daughter. We see her first as a scientist in a white smock, then as a woman in a tight sweater. Often engaged to another scientist, but is immediately attracted to the hero because he's more open-minded, more sympathetic, and the star. Her duty is to give the hero moral support and to get into trouble only he can get her out of. We frequently see her standing still or walking backward when we know she should be getting the hell out of the swamp, deserted house, laboratory, etc. Hallmarks: spunkiness and a tendency toward hysteria. Requirement for the actress: ability to do a Fay Wray scream on cue.

THE OTHER MAN

Sometimes he's the heroine's ditchable fiancé, and his only function is to act as the weak third point in the eternal triangle. More often he's a father figure and world-renowned scientist who, precisely because of his obsessive dedication to his work, has trouble coping with colleagues—and aliens. His instinct is always wrong: if aliens are benign he wants to kill them (*It Came from Outer Space*); if they're malevolent he wants to reason with them (*The Thing*). He usually gets zapped for his trouble, destroyed by the very force he had hoped to control. Hallmarks: vaulting ambition and high blood pressure. Requirement for the actor: a tendency to chew the scenery.

times these B-movie artisans have heightened a mood of everyday tension amid otherworldly invasions: as in Jack Arnold's *It Came from Outer Space*, Gordon Douglas' *Them* and Jacques Tourneur's *Curse of the Demon*. But in most SF the ironies of behavioral acting and the intricacies of a sophisticated *mise-en-scène* not only aren't needed, they aren't wanted.

By definition, a good SF movie needs only a provocative premise (fiction) and some dazzling special effects (science). It's essentially a moral tract with surreal illustrations. Stock characters (see the box below) can carry the film's message more dependably than full-bodied human beings. The dialogue can be inane, the direction pedestrian, the acting nothing more than a collection of clichés—but if the movie's "imagination of disaster" (Susan Sontag's phrase) is both picturesque and convincing, you've got an SF success. It's the genre's imperviousness to traditional critical standards that keeps SF movies off most reviewers' Ten-Best lists. Picking an SF film as one of your all-time favorites would be like choosing a restaurant for the wallpaper.

As in any pulp genre, the conventions in SF movies can be very restrictive, and most of them were established by the grandfather of SF satire, Jonathan Swift. Throughout SF cinema you'll find variations on the creatures in *Gulliver's Travels*: the pygmies of Lilliput (*The Incredible Shrinking Man, Attack of the Puppet People*); the giant Brobdingnagians (*The Amazing Colossal Man, The 30-Foot Bride of Candy Rock*); the mad scientists of Laputa (dozens of misguided geniuses in films from *Metropolis* to *Zardoz*); and the seemingly reasonable Houyhnhnms and their mutant slaves, the Yahoos (the Eloi and Warlocks in *The Time Machine*, the supermen and insectmen of Metaluna in *This Island Earth*).

Permeating all these permutations, at least in the fifties, was a suspicion-fear of Stalinist Russia. Can it be a coincidence that the same year, 1947, saw the beginning of the Cold War, the Alger Hiss trial, the Soviet Union's annexation of Poland and Hungary and the first wave of flying-saucer sightings? By 1949 Russia had The Bomb, and Americans were taking for granted the dehumanization of the individual under Communism. Could it happen here? The assumption of the next decade's SF films was that it could. The imagination of disaster was a documentation of paranoia. The Martians with their death-rays and mind-control were stand-ins for a more terrestrial totalitarianism, and the gigantic monsters spawned by the atom bomb were oversized personifications of McCarthy-era anxiety. What's curious is that this message was conveyed in the most sanitized and humorless of genres. SF movies saw human emotion as just another plot factor; human eccentricity was highly suspect. In a lot of SF, Us vs. Them was a case of the good robots against the bad ones.

But one should never underestimate the ingenuity of schlock merchants in search of a buck. You can't dismiss a genre that comes up with titles like *The Incredibly Strange Creatures Who Suddenly Stopped Living and Became Crazy Mixed-Up Zombies*; or movies like *I Killed Einstein, Gentlemen*, about some scientists who, on discovering that the atom bomb has made women sterile, are sent back in time to kill Albert Einstein. And there's the occasional movie, like Don Siegel's *Invasion of the Body Snatchers*, that belies its lurid title and provides a chilling parable of the humanist's helplessness against a conspiracy of fellow-American "pods." When we see *The Body Snatchers* today, we forget about the cause of these creatures' inability to love (seedlings dropped from outer space) and concentrate on the alienation effect. The movie is still terrifying, partly because fifties paranoia about a Soviet conspiracy has given way to seventies cynicism about our own government, and about ourselves. Steven Spielberg's work in progress, *Close Encounters of the Third Kind*, taps this new mood. According to one insider, the movie is about a Watergate-type cover-up of a UFO landing—and guess who the bad guys are. As a humanoid possum once said, "We have met the enemy and he is us."

So maybe we shouldn't write off the SF movie as prophesy—at least until 1984, when we'll find out whether Jerry Brown is a home-grown Big Brother, or until 2001, when Amy Carter may prove to be our very own Star Child.

Turn the page for a monsterography of science-fiction films.

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SCIENCE FIGMENTS

To each his own fetish, or phobia. SF cultists often choose their favorite movies on the basis of the creatures that appear in them. So here's *New Times* date-a-mate monster service. Pick your favorite, check your *TV Guide* and get to know your beast.

ANIMAL

Ants: Them (1954), Monster from Green Hell ('57)
Bat-Rat-Spider-Crab: The Angry Red Planet ('60)
Birds: The Giant Claw ('57)
Brachyura: Attack of the Crab Monsters ('57)
Caterpillar: Mothra ('62)
Dinosaur: Godzilla, King of the Monsters ('55), *et al.*
Frogs: Beach Girls and the Monster ('65), The Creature from the Black Lagoon ('54), *et al.*
Heloderma suspectum: The Giant Gila Monster ('59)
Hirudinea: The Giant Leeches ('59)
Lizards: The Hideous Sun Demon ('55), The Reptile ('66)
Mantis religiosa: The Deadly Mantis ('57)
Octopus: It Came from Beneath the Sea ('55)
Rabbits: Night of the Lepus ('72)
Rhedosaurus: The Beast from 20,000 Fathoms ('53)
Rodents: The Killer Shrews ('59)
Sharks: The Amphibian Man ('62)
Shrimps: Ebirah, Horror of the Deep ('66)
Snails: The Monster That Challenged the World ('57)
Spiders: Beast from Haunted Cave ('60), The Black Scorpion ('57), The Spider ('58), Tarantula ('55)
Turtles: Gammera the Invincible ('66)

VEGETABLE

Carrot: The Thing ('51)
Plants: The Day of the Triffids ('61), Invasion of the Star Creatures ('59)
Trees: The Navy Vs. the Night Monsters ('65), The Woman Eater ('57)

MINERAL

The Monolith Monsters ('57)
2001 ('68)

SUPERMEN

The Day the Earth Stood Still ('51)
The Man Who Fell to Earth ('76)
Metropolis ('27)
Planet of the Apes ('68), *et al.*
Things to Come ('36)
This Island Earth ('55)
Village of the Damned ('60)
X, the Man With the X-Ray Eyes ('63)
Zardoz ('74)

ROBOTS AND COMPUTERS

Aelita ('25)
Alphaville ('65)
Attack of the Robots ('62)
The Colossus of New York ('58)
Colossus: The Forbin Project ('70)
Creation of the Humanoids ('62)
The Day the Earth Stood Still ('51)
The Earth Dies Screaming ('64)
Earth Vs. the Flying Saucers ('56)
Forbidden Planet ('55)
Gog ('54)
The Human Duplicators ('64)
Kronos ('57)
Metropolis ('27)
The Terrornauts ('67)
THX-1138 ('67, '71)
2001 ('68)
Westworld ('73)

YUCCHY BLOBS

The Blob ('58), *et al.*
The Crawling Eye ('58)
The Creeping Unknown ('55)
The Green Slime ('69)
Invaders from Mars ('53)
It Came from Outer Space ('52)

MUTANTS

The Day the World Ended ('56)
Invaders from Mars ('53)
The Omega Man ('71)
This Island Earth ('55)
The Time Machine ('60)
Zardoz ('74)

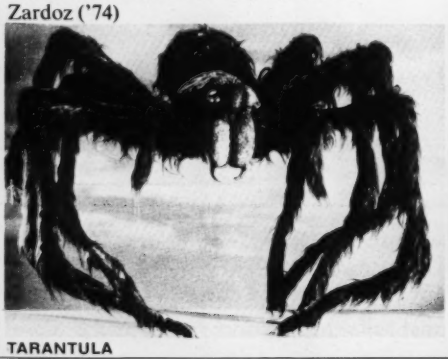
CLOUDERS OF MEN'S MINDS

The Beast with a Million Eyes ('55)
The Brain from Planet Arous ('57)
Invaders from Mars ('53)
Invasion of the Body Snatchers ('56)
The Invisible Invaders ('59)
It Came from Outer Space ('52)
The Space Children ('58)
War of the Satellites ('58)

JUDEO-CHRISTIAN, ALL-AMERICAN GOD

Red Planet Mars ('52)

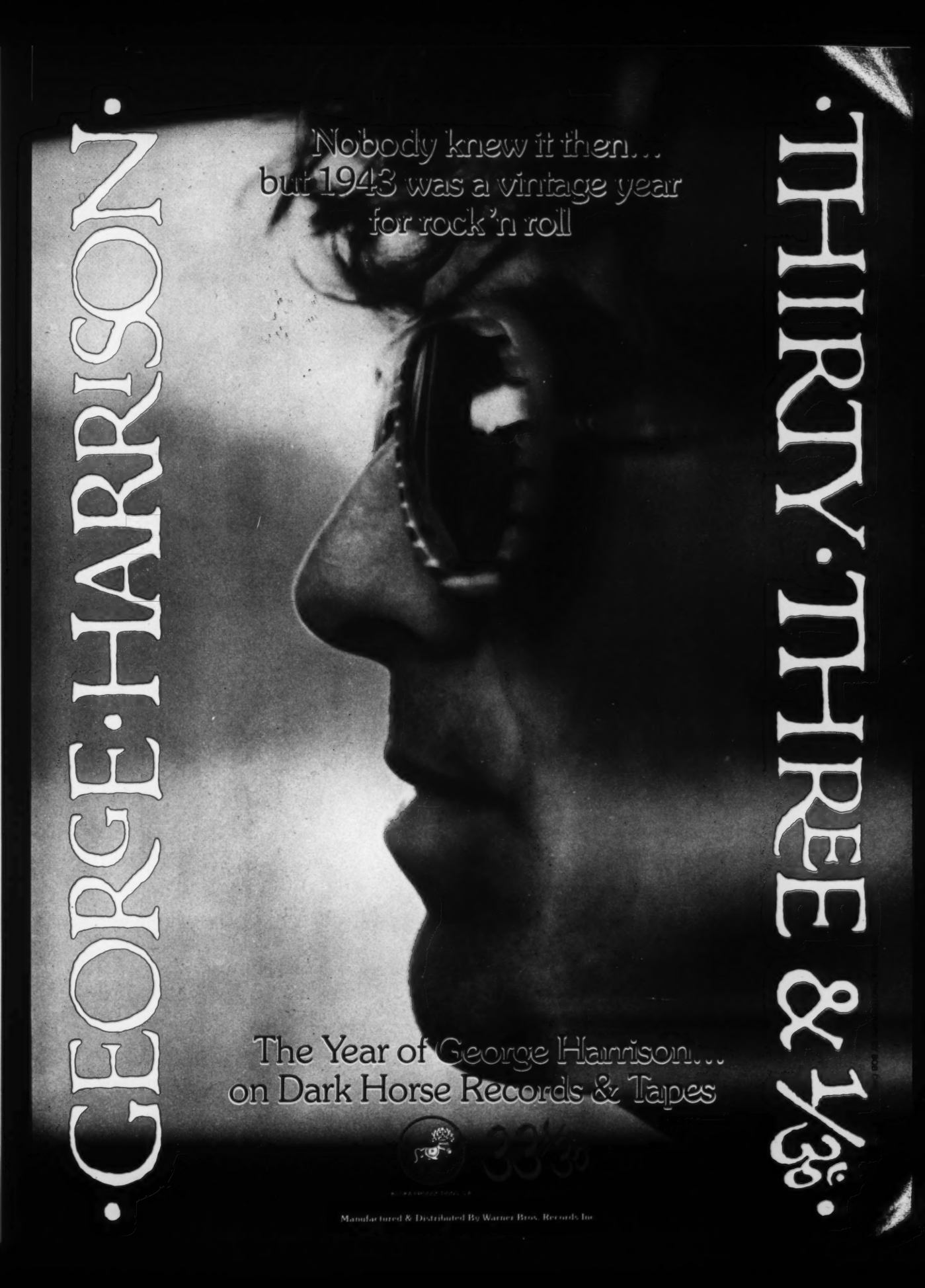
Sources: John Baxter's *Science Fiction in the Cinema*, Carlos Clarens' *An Illustrated History of the Horror Film*, William Johnson's *Focus on the Science Fiction Film*, Donald C. Willis' *Horror and Science Fiction Films*.



TARANTULA

THE REPTILE

BEACH GIRLS AND THE MONSTER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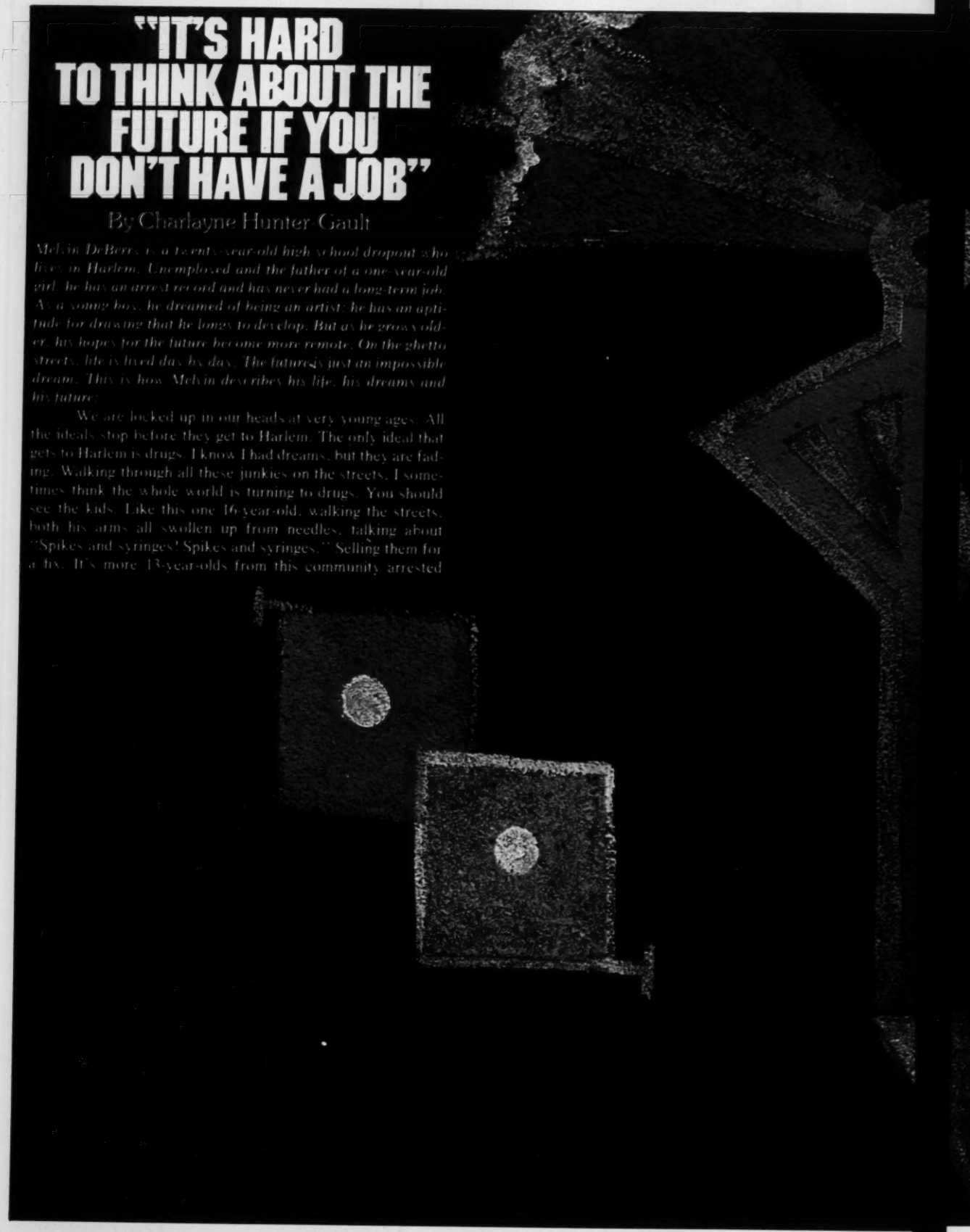
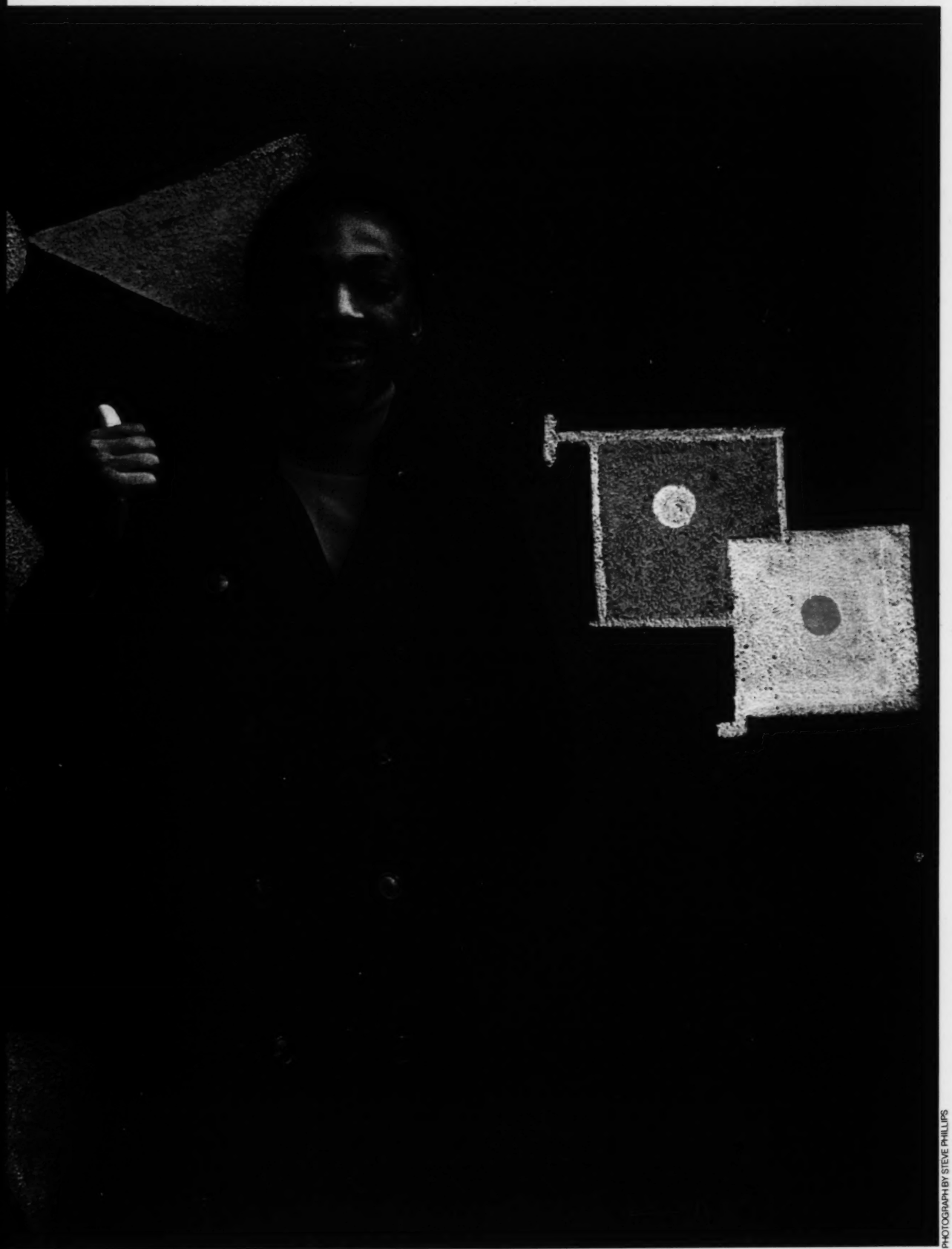
"IT'S HARD TO THINK ABOUT THE FUTURE IF YOU DON'T HAVE A JOB"

By Charlayne Hunter-Gault

Melvin DeBerry is a twenty-year-old high school dropout who lives in Harlem. Unemployed and the father of a one-year-old girl, he has an arrest record and has never had a long-term job. As a young boy, he dreamed of being an artist; he has an aptitude for drawing that he longs to develop. But as he grows older, his hopes for the future become more remote. On the ghetto streets, life is lived day by day. The future is just an impossible dream. This is how Melvin describes his life, his dreams and his future:

We are locked up in our heads at very young ages. All the ideals stop before they get to Harlem. The only ideal that gets to Harlem is drugs. I know. I had dreams, but they are fading. Walking through all these junkies on the streets, I sometimes think the whole world is turning to drugs. You should see the kids. Like this one 16-year-old, walking the streets, both his arms all swollen up from needles, talking about "Spikes and syringes! Spikes and syringes." Selling them for a fix. It's more 13-year-olds from this community arrested





PHOTOGRAPH BY STEVE PHILLIPS

than the average 23-year-old. The pushers get the young kids to hold the drugs 'cause if they get arrested they just go to children's court. The judge spanks their hands and tells them "Go home. Don't do that no more."

I was arrested for selling drugs. I had dropped out of school and couldn't find a job. Things were getting desperate and I was getting depressed. It was easy to hook up in the streets. Like collecting unemployment insurance. In a few minutes, I could make $250 selling drugs. But the faster it came, the faster it went. And then I got busted and did two months at Riker's Island.

I want to be an artist, the baddest artist in the world. I want to learn all kinds of art, not just drawing and painting, but sculpture. And I want to live a rewarding life. But I don't know—maybe they'll hold my record against me. Like I went to this job and on the application it asked if I had ever been arrested. When I filled out that I was arrested for drugs—the lady with the application—I saw the look in her eyes, saying, "Oh, no. Don't call us, we'll call you."

I think if our kids are going to have a future, they should just go around snatching addicts off the streets and put them into some kind of program. But I wouldn't deal with the pushers. They're just a source to the course. It's the politicians in this thing. If they weren't really behind this drug thing, they could cut this thing off from Turkey and stop all this stuff coming in from Mexico. White powder. Turkey to Harlem. That's the whole connection. But they aren't going to do it, 'cause money talks.

Maybe if we had more black politicians up front instead of being just fronts for white politicians. They come from these areas. And the key to so many things is in these urban areas. I don't have much faith in politicians, but maybe Jimmy Carter can help. He's bringing a little confidence because he's for the people.

I used to go to the polls with my mother. President Kennedy was running. I had heard so much talk about him. I told my mother to vote for him. I think Jimmy Carter could be another Kennedy. I just hope he don't get cut down. I think, though, it could happen. By neglected people. They don't care that much. They just think, what have I got to lose. Neglect is a cold feeling.

I didn't vote. But I might next time, if I could see something happening. Like some jobs. It's hard to think about the future if you don't have a job. I think there should be jobs for everybody. I had tried lots of times. At the state employment, they kept me coming back. After a while, I felt the man was putting me on a bull tip. Sending me places and people saying, "Oh, I'm so sorry. I wish you had come earlier. We don't have any openings." All that runaround was aggravating. This is supposed to be a country of opportunity. That's why all the different races come over here. But I'm already here. And I couldn't find a job. That's when I thought, "do or die," and went to the streets. A lot of my friends couldn't get jobs and some of them just bugged out. I got a friend, 19, look like 39. Only thing he lives for now is the wine bottle. He dropped out just like I did. I guess I was just more strong-minded.

In school, maybe I was lazy and that's why I dropped out. But it was a school where gangs roamed the hallways, students threatening the teachers, 30 kids in a class. And they didn't have no kind of art thing. I had always wanted to be an artist. When the kids in the first grade were drawing little stick men, I could draw bodies and faces. But once I got to high school I saw my future really going down. There was this drug thing in the streets, and nothing going on in school. It was like a cloud coming down over me, cutting me off completely.

White kids don't have these problems. I know because when I used to sneak onto the subway, I would see them, all dressed up with nice things. And me in sneakers that would wear out about once a month. This busing thing hurt me to my heart, because I wouldn't have minded being bused. If they had done it that way, we wouldn't have had the overcrowding and the kids would have gone to school. But they're even closing schools in our community. It's like white people are deliberately trying to cut off our opportunities. Killing the black kids with a lack of education. If this thing keeps up, it's going to be a disaster area. All the problems that they are not taking care of now—it's going to come down. My generation may just get lost.

But I don't want that to happen to my daughter. She's a year old, and I can see it in her wrists. She could be another Aretha Franklin. I don't want her to grow up living the life I've lived. I want her to have something better. I want her to be taught right and to have some chances. The schools are so raggedy.

My generation is going to be tougher about demanding that the schools do what they're supposed to do or there's going to be a war, between us and the Board of Education. We are a tougher generation and our hearts are harder because we had to come through more. We're not taking no mess. We're going to have to demand. Because if we don't demand, you don't get nothing.

I want a future where the family sticks together. That's especially important for the black family. Things are too scarce for us to be apart. Fighting each other. The only way I feel we can stay on the right track is to stay tight with the family. This way, I can pass on to my daughter some worth . . . if not necessarily money, values and self-confidence.

I want to give her things, but right now, the last thing I was able to give her was a box of Pampers last month. She is with her mother and her people. Her mother wants to get married, but how can I get married when I don't have anything?

I want to settle down, though, where my daughter can have both her parents with her. And I'd like to get her out of this environment, because the only way you can grow up in it and not get messed up is to stay in the house all day. But I don't want to move to the suburbs. I want to stay in Harlem. A nice quiet area. I wouldn't want to leave the city because I think I would get homesick. You know, it's so many things happening in the city. It's like watching TV. I want to stay here, around my people. I'm not prejudiced, but it's because maybe one day I can do something.

You know, I once wanted to go to Harvard. I wish I could. Because I think the best kind of leaders for our people would be the ones who came from the streets, got a good education and then tried to do something. I think they should have some kind of government position dealing with the youth. A Secretary for Youth. And have the young people dealing with other young people

The best place for getting our minds right, though, is in church. But I don't go. There's more devilment in the churches than there is on the street. But if they would start speaking out more in the churches I would go back. My mother and father have been going to the same church for years. My father for about 15, and my mother all her life. When she can't go, she sends her offering by somebody.

We have more churches in Harlem than in some whole cities. If they got back on the track, I would go, with the family. I would even join the choir, 'cause I love those hymns. Just listen to this one: "One more day. I thank the Lord for one more day." ●

Charlayne Hunter-Gault is a reporter for the New York Times.

Movies

Hard travelin'

By Richard Corliss

If you're in your forties or fifties, you may remember Woody Guthrie from his records and concerts. If you're in your twenties, you may have first heard of him as Arlo's disabled dad, or perhaps as the composer of "This Land Is Your Land," the unlikely anthem of both George McGovern and United Airlines. But if you grew up in the late fifties, during the folk music revival, you probably learned about Woody and heard his songs from Pete Seeger, The Weavers, Odetta, Ramblin' Jack Elliott and, inescapably, The Kingston Trio. This phenomenally popular group and its host of equally bland imitators took Woody's ballads for Americans—his songs for the working class and the wish-they-were-working class—and transformed them into frat-house harmonics for the Silent Generation. In their adaptation of "Ragged But Right," the Greenbriar Boys (a more spirited and authentic urban bluegrass trio of the period) noted the ironic distance between folk songs and their striped-shirt-and-khaki-trousers interpreters: "Since you folk singers are so busy ridin' freight trains and walkin' up the highway, how do you get so much time to fill out all them there copyright forms?"

We'll never know what Woody Guthrie thought of these pasteurizers of plenty. In 1954, just as a new generation was to hear "Roll On, Columbia," "Reuben James," "Deportees" and "So Long, It's Been Good To Know Ya," Woody entered a New York hospital with Huntington's chorea, a degenerative disease of the nervous system that left him vegetating until his death in October 1967, the month Arlo's talking-blues "Alice's Restaurant" was released. Now Woody has been pasteurized again, in **Bound for Glory**, and an artful job it is. *Bound for Glory* is the best-looking and most beautifully acted movie of the year, so we probably shouldn't look this particular gift horse in the mouth—even when it's a horse of a different color. As an anonymous source close to the film told Joseph McBride of *Film Comment*, Woody was "a maverick red"; *Bound for Glory* is more Hollywood pastel. But maybe this doesn't matter. Director Hal Ashby has crafted a fine film out of the raw material of Guthrie's life and hard times from 1936 to 1940. And if Ashby engages in some movie myth-making by sanding off its subject's rough political edges, well, Woody was eager enough to create a free-spirited, I'm-the-people legend about himself. But then, he knew he had the stuff of legend in him.

Every man is a hero to his autobiographer, and in *Bound for Glory* (published in 1943) Woody Guthrie proved himself no exception. Most of the jokes he tells on himself are the kind Francis of Assisi would appreciate, if Brother Sun had a funky sense of humor. When one girl tells Woody he looks as if he never worked a day in his life, he shows her the tips of his guitar fingers and says, "I got jest as many callouses on my hands as you!" But we know from the previous 16 chapters how much sharecropping and dirt farming he'd done. What we hardly know from his description of early days in Pampa, Texas, is that Woody had a wife and two kids. If he'd cared to, Woody could have drawn the classic dilemma between an artist's obsession with his work and his responsibility for his family. But Woody must have realized that, typical as his attitudes and experiences were of his time and surroundings, he was also unique. Listen to his records, as he spins out stories and sermons, and you get a sense of this grass-roots radical's galvanizing personality. His social songs simplified the politics, crystallized the concerns, alchemized populist-left rhetoric into folk poetry that stirred and stirred up his audiences, that lifted them up and got them up to unionize or just harmonize. It must have been good to know him.

Hollywood pastel: the real Guthrie (left) and Carradine's portrayal

And David Carradine catches Woody's special quality without doing an impression—which is just as well, since Woody, as described by Pete Seeger, was "a short, wiry guy with a mop of curly hair," and Carradine is a strong, straight-haired six-three. Loose-jointed and keen-eyed (like the film), Carradine gets inside Woody, makes him distinctive even at the beginning, when Woody was nobody and everybody was down on his luck in the thirties. From Guthrie's Pampa stories the movie takes three anecdotes to set the tone: Woody's on-the-spot fortunetelling for an anxious oilman, his "healing" of a catatonic woman and his sympathetic encouragement of an

"insane man." Woody has some gift, powerful but undefined, for making people feel better about themselves. And Carradine has a trick of staring at other actors a second or two after he's spoken to them, as if to test the effect of his advice, that helps give his performance a quiet, assured power. He may not fit in Woody's clothes but he can fill his shoes.

The large cast is uniformly excellent. Ronny Cox is the singer-unionizer (patterned after Cisco Houston and Will Geer) who knows just how far to go in organizing the farm workers and baiting the farm owners, and who admires Woody for daring to go too far. Randy Quaid, as an angry migrant, is perpetually hunched over, as if trying to force his huge body into a spirit defeated by the lack of a job. Melinda Dillon brings a parched, ragdoll beauty to the role of Woody's long-suffering wife, and Gail Strickland is gracious and vulnerable as a liberal lady of means who falls in love with Woody. When Woody leaves her, they touch hands and he slowly withdraws his in a way that manages to summarize their tender, elusive affair. It's a small example of American behavioral acting at its best, and the movie is full of moments like it.

Ashby is always working to place a gloriously gilded frame around these moments, but sometimes he works too hard. When Woody's kids drop a ball of twine and it rolls just to the edge of the frame but not past it, you suspect Ashby planned it that way. He and cinematographer Haskell Wexler (who receives an extraordinary credit right after the opening title) give the scenes in Pampa a dry, grainy look, as if they were shot from behind a screen door in a dust storm. The rest of the movie looks right purty, but too often Ashby and Wexler will trivialize a character's feelings by bathing him in a soft-focus glow, or backlighting him against the southwestern sun. Occasionally you may be so dazzled by how picturesque a shot is you might not notice it makes no sense, as when Woody sits alone in a tent singing while a group of pickers listen outside in the pouring rain.

Shots like these are symptomatic of the movie's attitude toward Woody Guthrie. Whether Woody was in fact a Communist isn't important—although, as Pete Seeger notes, "the author of 'This Land Is Your Land' was in 1940 a columnist for the small newspaper he euphemistically called *The Sabbath Employee.* It was *The Sunday Worker,* weekend edition of the Communist *Daily Worker.*" Nor is it necessary for Ashby and screenwriter Robert Getchell to pinpoint Woody's political affiliation. What's important to understand is that Woody was working for more specific goals than the brotherhood of man. "I met a lot of different kinds of people on the road," the movie Woody tells his favorite rich lady. "And they all got somethin' in common. Every one of 'em got somethin' to give." The film turns Woody into a Will Rogers for the down-and-out: he never met a poor man he didn't like.

But movies have softened historical figures before, and will again. John Ford took some of the bitterness out of Steinbeck's *The Grapes of Wrath,* and still made a strong, beautiful film. Woody Guthrie made his own changes when he wrote his famous song about Steinbeck's "Tom Joad." *Bound for Glory* works unashamedly in this mode, popularizing a feisty kind of populism. It completes Woody's own legendmaking. As a newspaper editor says in a later Ford movie, *The Man Who Shot Liberty Valance,* "When the legend becomes fact, print the legend." Ashby's film is an eloquent elegy to Woody Guthrie, the self-made legend.

Silver Streak *arrives: after a crawling start, a slam-bang finish*

The Silver Streak is a new-fangled Amtrak-type express filled to capacity with lechers and molls, art historians and art forgers, FBI men and one unsuspecting leading man (Gene Wilder). And as if all this weren't preposterous enough, it actually runs on schedule. This train ain't bound for glory, but **Silver Streak** is bound to entertain—if audiences can endure, sleep through or simply avoid the movie's first hour. The movie, like most American trains, takes forever to get started as it introduces characters and jerry-builds situations without ever engaging the viewer's attention, let alone his complicity. Gene Wilder is thrown off the train, hitches a ride with a hearty old-lady Amelia Earhart, kills a bad guy with a spear gun and is arrested for mass murder. All this doesn't sound like the stuff yawns are made of; but it izzzzz.

Part of the trouble is that *Silver Streak* takes ages making up its mind whether it wants to be a comedy, a mystery-thriller or an adventure movie. And this indecision is underlined by the pretitle assertions of authorship. *Silver Streak* is "A Frank Yablans Presentation," "A Martin Ransohoff–Frank Yablans Production," "An Arthur Hiller Film" and "A Miller-Milkis–Colin Higgins Picture." The credits sound like the list of defendants in a Xaviera Hollander paternity suit. And all these cooks have toiled to produce a very thin broth—a McDonald's *soup du jour.* Colin Higgins, who wrote the fey *Harold and Maude* for Hal Ashby, is coasting here with an intriguing scenario that he never bothered to flesh (or even cardboard) out. The producers, Thomas L. Miller and Edward K. Milkis, generate little of the blue-collar vitality you find in their *Happy Days* and *Laverne and Shirley* TV series. And director Arthur Hiller, who steered Pad-

dy Chayefsky's *Hospital* through the corridors of bedlam, seems incapable of helping Wilder to release his patented comic hysteria, or of allowing Jill Clayburgh (as the plucky heroine) to display much more than a bemused smirk.

But then, just when all looks bleak for the future of Hollywood's bread-and-butter comedies, Richard Pryor comes speeding to the rescue. Pryor has brought patches of lunatic lucidity to the tamest of movies (*Lady Sings the Blues, Bingo Long, Car Wash*). Here he simply takes *Silver Streak* by the throttle and gets it moving. Pryor has a lot of fun in one scene trying to pass Wilder off as a black dude, with the aid of some shoe polish, a transistor radio and a few quick lessons in Natural Rhythm. Pryor gives the film enough self-confidence so that by the end it can barrel into Chicago's Union Station with the most spectacular movie train wreck since *The Greatest Show on Earth*. Even with its slambang climax, *Silver Streak* isn't anything to go out of your way to see. But if it happens to be the in-flight movie on your trip home for Christmas, keep one eye peeled for Richard Pryor, and enjoy the rest of your flight.

Music

Last Waltz at Winterland

By Robert Palmer

"We would have to build up a kind of anger," Robbie Robertson was saying. It was eight in the evening, but he had been awake only a few hours. The night before he had performed with The Band, the group for which he was a songwriter, guitarist and spokesman, in its final public appearance, billed as "The Last Waltz." Over 5,000 fans had paid $25 each to spend Thanksgiving afternoon and evening at San Francisco's Winterland, where they ate a catered turkey dinner, listened or danced to an orchestra that played waltzes and finally heard The Band "and friends"—Bob Dylan, Van Morrison, Joni Mitchell, Eric Clapton, Muddy Waters, Neil Young and others—play for almost five hours. The party that followed lasted well into the next morning and was capped by an impromptu Dylan performance at around 9 a.m.

Now Robertson was leaning back in a chair in his hotel room, pulling a fuchsia scarf tighter around his throat. His voice sounded husky and frayed and his eyes were barely propped open behind rose-tinted glasses. He was trying to explain why The Band had decided to end its career as a performing group after an unprecedented 16 years together, and finding the words wasn't easy. At age 32, he had been playing with drummer Levon Helm, bassist Rick Danko and keyboard players Garth Hudson and Richard Manuel for half his life.

"It's kind of vital to our survival to change gears," he finally said. "The road is really of no consequence to us any longer. We did it so much and in so many different ways that it can only become repetitive and a business proposition. And it's a hard thing to do for business' sake." He shifted his weight in the chair and then jumped to his feet, looking for a cigarette. "It became really painful for us when we played. We didn't get to just go out and boogie around. Over the years or something it turned into such an emotional thing that there was a lot of strain and struggle in our concerts. We didn't fly through them." He dropped back down in the chair. "We had to build up an attitude to perform, a kind of anger, like I said. Now this is something I only feel, kind of; I never tried to figure it out, but . . . I feel like that kind of thing could make an old man out of somebody."

Hard as the road had been, preparing for The Last Waltz was harder. Bill Graham and his staff at Winterland planned Thanksgiving dinner for 5,000 while The Band took care of more details, including invitations to guest performers. The obvious first choices were Ronnie Hawkins, the Arkansas-born rockabilly singer who first put the group together as his backup band, and Bob Dylan, who toured with them off and on from 1966 until 1974. Both were eager to participate. Three weeks before the concert, director Martin Scor-

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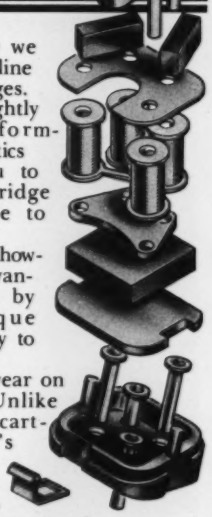

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cese (*Mean Streets, Taxi Driver*) offered to shoot it in 35 mm., using some of Hollywood's most respected cinematographers. "He knows our music so well," Robertson enthused, "he can tell you the twelfth line after the violin segueway in 'Daniel and the Sacred Harp.' He didn't shoot documentary style; every shot and every lighting effect was figured out song-by-song, line-by-line."

The Last Waltz began around 4 p.m. in a Winterland that had been transformed (by veteran Hollywood designer Ira Levin) with chandeliers and backdrops from the San Francisco Opera's production of *La Traviata*. The Band began to play around 9 p.m., and after three numbers they were joined by a horn section that included Howard Johnson and Tom Malone and lent a blaring circus atmosphere to "Life is a Carnival" and "Ophelia." Richard Manuel, who was resplendent in an orange and green checkered suit, was singing at peak power in "Georgia on My Mind," and Levon Helm poured overwhelming emotion and energy into one last version of "The Night They Drove Old Dixie Down." Rick Danko switched to fiddle for "Rag Mama Rag" and Garth Hudson ended the tune with an astonishing piano improvisation, mixing swing-era jazz with Jerry Lee Lewis flourishes, applying karate chops to the keyboard, and leading through a series of false conclusions into a 1930s riff from "In The Mood."

Then it was time for the guests. Hawkins was first, growling out "Who Do You Love" and practically panting for breath as The Band, unleashed from the strict arrangements of its regular repertoire, surged powerfully behind him. Dr. John appeared, wearing a pink dinner jacket, sunglasses and a bebop beret, and sang "Such a Night" with a cheshire-cat grin on his face. Bobby Charles joined them for a jaunty Louisiana country-style number, and as he sauntered off with Dr. John, Paul Butterfield came on for a blistering "Mystery Train." Muddy Waters guided the group through "Caldonia" and a sinuous, slowly uncoiling version of "Mannish Boy," with Butterfield wailing on harmonica while Garth Hudson created an other-worldly orchestral background with his synthesizers and organ.

Eric Clapton did two numbers, and again the second one was outstanding, as Robertson engaged him in a guitar duel and pushed him into an impressive display of technique and passion. Neil Young, announcing that "it's one of the pleasures of my life to be on this stage with these people," did two acoustic tunes, and Joni Mitchell did three. Neil Diamond was on and off quickly. Van Morrison shared a soul version of "Tura Lura Lura" with Manuel and then tore up "Caravan," strutting in front of the horn section and kicking his feet to their accents. The Band, with guest vocalists Mitchell and Young, finished the concert's first set almost three hours after it began with "Acadian Driftwood."

There was a reading by San Francisco poets and then Garth Hudson kicked off the second set with a prerecorded tape of Tibetan monks chanting and a cow mooing, over which he constructed an austere musical architecture that eventually turned into "Chest Fever." The group tried Robertson's "The Last Waltz," which he had begun in New York weeks earlier but finished only the day before, and at one point the other singers stumbled, leaving Robbie to sing alone "The last waltz is through/ But that don't really mean the party's over." They followed that with "The Weight," and then Dylan charged onto the stage in jeans, leather jacket, checkered shirt and an imposing white hat. "We were tired," Robertson recalled the next day, "but Bob just lifted us up." Several numbers from *The Basement Tapes* had been rehearsed, but Dylan chose to keep The Band guessing by starting his set with "Baby Let Me Follow You Down," segueing without stopping into "I Don't Believe You," "Hazel" and "Forever Young," and then concluding with another, even harder rocking version of the first tune.

For the finale, Morrison, Clapton, Butterfield, Charles, Young, Mitchell, Dr. John, Diamond, and Hawkins reappeared, Ringo Starr and the Stones' Ron Wood joined them, and Dylan led them all through "I Shall Be Released." As the musicians filed from the stage, Ringo began a drum solo, Helm joined in, and a full-scale jam began to rage. Steve Stills plugged in yet another guitar and then Garth Hudson insinuated an airy organ embroidery, turning the improvisation in another direction.

While the jam was winding down, Bill Graham appeared in Robertson's dressing room. "You have to do one more," he said. "This is your night." The Band did "Don't Do It (Don't You Break My Heart)," which included the telltale line "My only mistake was loving you too much," and then The Last Waltz was over. It should make a remarkable film and live album, but plans for both are still vague. The first release will be a new studio album, recorded by The Band during the last hectic weeks before the concert. There will be more studio albums from the group in the future, but this one should be special. "It was impossible to write and record an album in two weeks," Robertson sighed, "and it was impossible to put on a concert like this one. So the concert and the album have the same sort of spirit."

NEAL PRESTON

Winding up The Last Waltz: left to right, Dr. John, Joni Mitchell, Neil Young, Rick Danko, Van Morrison, Bob Dylan and Robbie Robertson

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Records

By Jim Miller

★★★ **Radio Ethiopia,** *Patti Smith Group* (Arista);★★ **Rock and Roll Heart,** *Lou Reed* (Arista);★★ **Live at CBGB's** (Atlantic). Like Lou Reed, Jim Morrison and Mick Jagger before her, New York poet/songstress/artiste Patti Smith wants to play pop goes bohemian. In her liner notes, she invokes Rimbaud and the salons of Paris; but to produce her second album, she has chosen Jack Douglas, the man who helped package the neo-glitter of Boston's Aerosmith for the boogie crowd of Heartlands, U.S.A.

Her forte is neo-dada set to the blare of pop primitivism: André Breton, meet "96 Tears." With Douglas' help, Smith and group have polished their junk metal sound; perhaps Peoria will embrace bohemia in boogie drag. Even better, the rock context adds visceral significance to the "voluptuous diseases" Smith dissects in her lyrics. (Imagine, boys and girls: a whiff of opium in daddy's den tonight.)

There's a problem with neo-dada, though, especially for blasé urbanites: the shock value of its gestures cannot survive many reruns—and in pop, dadaists like Lou Reed have been here before. Fortunately, Smith's current aspirations have forced her to edit her songs and temper her more blatant gestures; her best new material is concisely oblique, potent without the pretense that marred so much of her debut last year. Especially recommended is "Distant Fingers," the spookiest bit of rock I've heard recently.

Lest we forget the granddad of pop dada, it should be noted that Lou Reed has a new album out. It embalms every guileless cliché the man has ever coined, in arrangements featuring a saxophone in distress—apt music for a mummy's coming-out party. Finally, for those who would rather hear the new wave of NYC neo-neo-dadaists, there is *Live at CBGB*'s, which offers everything from goofy reggae (now really) to hard-core social realism (try "Everybody's Depraved" by Stuart's Hammer). In short, good clean fun for the entire family.

★★★ **Message in the Music,** *The O'Jays* (Philadelphia International). In an album filled with sweet ballads, soul producers Gamble and Huff show they haven't lost the magic touch; "Desire Me" is a stunning piece of gospelly eroticism, suspended between flamenco flourishes and Basie swing.

Books

Don't forget to cry

By Geoffrey Wolff

A Death in Canaan *by Joan Barthel, Introduction by William Styron.* Thomas Congdon Books/Dutton (328 pp., $9.95).

Like many readers I was first attracted to *New Times* by an article about a young man, Peter Reilly, who had confessed to having murdered his mother in Canaan, Connecticut, some months before Joan Barthel's troubling investigation was published in these pages. It is a commendable practice of many journals to abstain from all comment apart from bare notice regarding work they have published. But Barthel's book is so humane, and the issues raised by it so troubling, that I would like to put aside, for now, conventions of reticence.

The murdered woman, 51, was Barbara Gibbons, but she named her son "Reilly" because she liked the surname. In any case, she did not know the name or the identity of Peter's father, who perhaps, as she told her son, had raped her. She was a difficult one to puzzle out: following a comfortable childhood she was down on her luck and on welfare; she was a heavy drinker, and lived with her son in the squalor of an ill-kept and ill-heated cabin; she was bright, prankish, quarrelsome, promiscuous, loving. There is much evidence that she and her son, despite

KEN CARTER

Before the tragedy: Peter and his mother

the awful circumstances of their life together, shared a lively and wholesome affection for each other. They also swore at each other, from time to time yielding to their frustrations.

Often Peter, an indifferent student but good citizen at the local high school, yearned for stability, for a family. And indeed two families treated him like a son, and he returned their kindnesses with gratitude. Just as he warmed to the parents of his friends, so did they often warm to his mother, responding to her childishness and spontaneity. Certainly nothing about Peter's association with his mother suggested to his friends that he was eager, or capable, of doing to her what the state of Connecticut decided he did to her during the few minutes after he returned home from a Teen Center meeting and before she was found by the ambulance crew he had called to their house.

Peter's mother was discovered in the bedroom she shared with her son. She was lying in five quarts of blood that had spurted from her body: her throat had been cut twice, and her head almost removed from her trunk. She had been stabbed through her hand, and in every quarter of her body. Her thighs, both of them, had been broken, together with three ribs. Her vagina had been mutilated, and she was found naked save for a T-shirt rolled above her breasts.

Hearing about this crime one psychiatrist said that a son could never have so brutally violated his mother,

and his colleague said that only a son could have. Neither of these doctors had met Peter Reilly, and neither have I, but Barthel's portrait of him does not leave room for the merest suspicion that he was capable of the crime to which he confessed. He is gentle in the extreme, passive, distracted, eager to please, not very bright, not quick to grasp consequences, no good at sham. Whatever he may be in fact, the people of his village rallied to his support with remarkable energy and unity, and managed to persuade a great many people of his innocence—with the result that today, following his trial and conviction for manslaughter, Peter is free, his original trial having been declared by its presiding judge a miscarriage of justice.

The principal evidence against Peter Reilly, and the only evidence worth a nickel, was his signed confession to the crime. This he delivered after 25 hours of interrogation, during which he had had little food and less sleep. He was not beaten or threatened with a beating. He was read his rights many times and was offered the opportunity to secure an attorney. No law was broken by the police, but many corners were cut, and he was led to his confession with cruel and cynical indifference to his ordeal by officers presumably persuaded of his guilt.

It happened this way: Soon after he was taken to the local station house he consented, in order to settle affairs so that he could return to the solace of friends, to take a polygraph test. Removed to Hartford and strapped to what William Styron in his introduction justly calls this "detestable machine," Peter failed his test. That is what he was told, though experts have known for many years that the so-called lie detector is so imperfect an instrument that its results are not admissible as evidence in court. But having "failed," Peter began to doubt himself. Surely he did not recollect having hurt his mother, and could not imagine having done such a thing. So it was suggested to him, repeatedly, that he had blacked out, that it had passed, this awful carnage and frenzy, in a kind of slow-motion dream. (Except that it passed in about five minutes, from beginning to end, according to the police.)

Peter believed in the authority of machines, and of policemen. Above all people he was prepared to believe that he would not be asked to admit to guilt if he were not in fact guilty. He asked what they thought he did, and the police told him. And he confessed to it, and then asked them, without sarcasm: "Are you proud of me?"

The transcript of Peter's interrogation is reproduced in abundance in this book, and it is scandalous and terrifying. No one who reads it will resist the hunch that, given sufficient shock and survival guilt and shame, a hostage of the police can be induced to confess to almost anything. Given the circumstances, it is Peter's resistance to confession that astounds, his frequent interjections as he wakes from his bad dream that "I think I'm saying things that I don't mean to say." At such moments he is reminded by one or another police officer that what he did was not so awful, not so consequential: "Hey, you know these things—everybody blows up once in a while."

It is the police who seem untouched by the crime, distanced from it. Yet Peter's own trauma, in explosive combination with his manner, made of him the worst kind of suspect and trial witness. Like Meursault in Camus' *L'Etranger*, like Alice Crimmins, the housewife who was convicted of killing her two children, Peter Reilly made a fundamental error: he failed to weep at the death of a kinsman. No more certain evidence of guilt was required in the Crimmins case, and of Meursault's rebellion against the conventions of mourning and shame an entire metaphysic was fabricated. These expectations run deep: evident indifference to the death of a blood relative intolerably violates tribal ritual and taboo.

Except, perhaps, in such a small town as Canaan, where the tribe knows its member as intimately as Peter is known. Intimately enough for townspeople to wish to restore Peter to their society immediately. Here was this boy whom the police had accused of grand guignol on a scale rare enough even in these bloody seasons, a boy who had confessed to sudden mayhem, a boy whom several families were eager to invite into their houses as a son. They knew Peter well enough to comprehend that they were not at his mercy—he was at theirs. In many ways Peter is helpless, and in some ways pathetic. His hunger for a father is touching, and his quickness to call people "Mom" and "Dad" is only the healthiest evidence of it. During his interrogation he asked the toughest of the Connecticut state troopers at work on his confession if he could live with him. The people he now lives with believe that one day "Peter is going to walk away from us, and not look back." During his interrogation his priorities were not what they might have been: he was most worried about the disposition of his Corvette and the effect of his confession on the band with which he played guitar.

While he was awaiting sentencing, after his conviction, he was oddly placid, removed from his circumstances. Barthel was amazed: "I hadn't expected him to weep and wail, but I wasn't prepared for this. He was making plans. He was making so *many* plans." To get a job, get married, buy a car. "He smiled . . . as though he didn't have a care in the world." Probably he loved and mourned his mother in his own way, perhaps he did not. Finally this does not matter. What matters is whether he killed her; and on that point Barthel suffers no confusion whatever: it never occurred to her (or to this reader of her book) that Peter was guilty. Time is the clincher: there wasn't enough. Nor was there blood on him or on his clothes. Nor could he have used the weapon he confessed to having used. The circumstances of this crime are meticulously developed in *A Death in Canaan*, and can no more fail to persuade us than they failed to persuade the trial judge that a "grave injustice" had been done in his courtroom and that "upon a new trial it is more than likely that a different result will be reached."

But this ruling was a long and lucky shot. What if the judge had been more stubbornly protective of his record? What if a private detective had not become obsessed with this case and developed new evidence? What if Joan Barthel's article had not been noticed by the lady who raised bail for Peter, with the help of his friends? What if Arthur Miller had not persuaded the *New York Times* to investigate the crime? What if people in Canaan had not understood Peter, and loved him? What if he had been left to the mercy of the law, and to justice?

There will be no new trial. As this goes to press, all charges against Peter have been dropped, and Connecticut governor Ella Grasso has ordered an investigation into the state troopers' treatment of this case. It is now clear that evidence completely exonerating Peter Reilly was in the hands of the police and of Peter Reilly's prosecutor, the late John Bianchi, who failed to share it with Peter's counsel, his judge or his jury.

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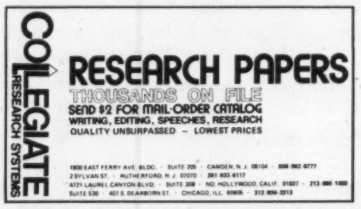

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The Weekly Newsmagazine

Food

California comes of age/By Robert Jay Misch

In contemplating the future it is often helpful to reflect on the past.

The great "Ignoble Experiment" had drowned in bathtub gin what little experience America had had with wine. California's vineyards had been torn up, her vintners dispersed. Suddenly, in 1933, the reprieve. What has happened in the past four decades is the second miracle of the wine.

In 1934, California wines didn't just have an inferiority complex—they *were* inferior. They were made from the wrong grapes, planted in the wrong places, fermented in the wrong way. In 1977, those mistakes corrected, California's wines stand up with the world's best.

Today's California vintners use for their best wines (the varietals—wines named for the variety of the grape) the "noble" wine grapes of the Vinifera family. The importance of climate has been acknowledged—even to the influence of microclimates (climates within climates) in the positioning of various grapes for optimum quality fruit. Finally, scientific oenological research has, among other things, resulted in the widespread adoption of cold fermentation, gentler pressing, more sparing filtration and proper aging in the most compatible wood for the wine.

Since 1970, California's acreage of high-quality wine grapes has increased vastly. Consider the two top grapes alone: Cabernet Sauvignon (red) has gone from 6,000 acres in 1970 to 27,000 in 1975; Chardonnay (white) from 2,700 in 1970 to 11,500 in 1975. California wine shipments have increased from 195,312,000 gallons in 1970 to 270,389,000 gallons in 1975, three-quarters of America's total consumption. So the problem of California's future isn't in production—it's in consumption.

Americans drink less than a gallon of traditional table wines (sparkling, sweet aperitif and dessert wines aren't included) per person per year. Compare that with France and Italy (28 gallons); Argentina, Portugal, Spain (20 gallons); Austria, Greece, Hungary, Switzerland (between 10 and 15 gallons). We're an also-ran thirtieth among the nations, nosing out Norway, China and Japan. Ah, there's homework to be done in the Land of the Free.

But we can do better. Compare our national .8 or .9 gallon to California's 2.5, three times as much. New York, the District of Columbia and a number of other urban pockets of relatively high consumption prove the same thing. Americans, who, per capita, drink 32 gallons of coffee, 25 gallons of milk, 21 gallons of beer and 6 gallons of fruit juices, are primed for greater wine consumption.

Since 1970, the annual wine growth rate is a whopping 33 percent. The younger wine-drinking set, fast becoming the dominant age group, tends toward drinking wine in moderation before, as well as during, a meal—partly because diet and health are hot news. Wine is no longer a mystique, the wine snob is passé and prices seem to have stabilized, generally at a reasonable level. (Prices vary by region and shop; the ones given here are approximate.) That's not all. The fact is that wines—particularly California's—are just plain better.

JONATHAN S. BLAIR/BLACK STAR

Here's my view of the wave of the (California) future. In a first category, the colossi: Gallo and United Vintners (Inglenook) offer some extremely palatable wines at extremely palatable prices.

The second group, medium large vinters: Almadén, Paul Masson, Christian Bros., Beringer and so on, which offer many well-made wines, including some "jug" wines. Some scorn jug wines, but so what? Isn't a magnum just an imported "jug"?

Then there's a third category: the medium to small "boutique" operations. Here's primarily where you turn for the wines to lay away—the wines of, and with, a future.

White wines I don't see for more than the short haul. Drink 'em young, within one or two years for most; maybe three to five for the best Pinot Chardonnays, such as Stony Hill (about $10), Chappellet ($7.75), Hanzell ($11.75) and Chalone ($8.50). These wines are scarce, limited in production and distribution, often sold out before they're born. (Wente's, under $4, is a good buy.)

The reds make more sense, especially Cabernet Sauvignon, the longest-lived of all wines. To "lay down" for a year or two, or three or five or even ten, seek out Mayacamas (about $11), Freemark Abbey ($6.50 for '71 to $9 for '69), Oakville ($6.25 for '70), Stag's Leap ($8.50 for '73) or David Bruce ($12.50 for '73). Other good names to watch for are Robert Mondavi, Château Montelena, Heitz Wine Cellars (especially their California "Martha's Vineyard"), Fetzer, Sterling, Du Val and Ridge ($6 to $15). And never forget these two old standbys: "Georges de Latour Reserve" ($8.50 for '71 to $14.50 for '65) and Louis M. Martini's "Special Selection" (about the same price).

There are many other fine bottles. Whether they are the exact counterpart of the great Chateaux of France is a question for the tongue of the taster. The grapes are the same. The methods are pretty much the same. But is a French-Canadian French? No, American Cabernets are *our* wines—grown on different soil under different skies. They can stand on their own corks. No longer need the questioning and plaintive "Isn't it just as good?" be heard in the land. ●

Future Tribute

A 21st century of undreamed abundance/By F.M. Esfandiary

The world is on the threshold of monumental breakthroughs. Never before have we advanced as rapidly and globally as today. Never has the future appeared as promising.

Yet the global mood is pessimistic. Even the editor of this magazine believes we will be back in the caves before we inhabit the galaxy. Most people cannot handle affirmation. They believe bad news is their birthright.

Because people are suckers for pessimism, doomsaying today is a multi-million-dollar business. We get our jolts from nay-saying best sellers, overkill news reports and disaster films. Tell Americans that pollution will soon engulf us, or that we are moving into a Dark Age of depleted resources, and they will not only swallow it but will ask for more.

Despair has always been intellectually fashionable. Pessimism is viewed as sensitive and realistic, optimism dismissed as frivolous and naive. So brainwashed are we by this outdated heritage that we still mechanically say no to life at a time when the breakthroughs around us are loudly saying yes—*yes*!

Pessimism about the future is nourished by our inability to look ahead intelligently. Most scenarios of the future have very little to do with the future; they are mainly extrapolations from the present and the past. Even science fiction remains bogged down in cosmic wars and monsters from outer space.

Whatever its roots, pessimism is no longer a rational outlook. In our radical age, pessimism is reactionary. It is antifuture. To grasp the dynamics of tomorrow, one must understand that today's breakthroughs are not simply technological, but that our fundamental situation within the universe is undergoing transcendent changes. Aeons from now, I believe the late 20th century will be remembered as that moment in evolution when the human species broke from its confinement to this microplanet and began spreading out across the solar system and universes beyond. We have begun transcending the limitations of terrestrial life and human nature—bursting into an infinite universe of infinite potentials. All the primal screaming about limits to growth and finite resources is a galactic farce.

Bt the year 2000, the near solarsphere will teem with astrocolonies. Thousands of people will wing back and forth between planets and their extraterrestrial communities. A whole new species of solar people will vigorously emerge—free of nationality, free of ethnicity, free even of strong ties to this planet. They will be increasingly time-free and space-free.

By the first decade of the new century life expectancy will be nearly indefinite, with tens of millions of people living well beyond 100 years and going strong. How will we achieve such life spans? Through genetic and biological reconstructions, prosthetics, antiaging drugs, indefinite replacements of perishable organs, continuous telemonitoring of everyone's vital body functions.

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We will deanimalize our anatomies, creating durable, modular, imaginative new bodies adaptable to all elements on this planet and suitable for existence in space. We will be well on our evolutionary way to a human stage free of pain, free of suffering, free of death.

At the turn of the new century, the flood of solar energy, nuclear fusion and hydrogen fuel will usher in a whole new era of undreamed abundance—abundant food, abundant raw materials, abundant commodities. This new abundance will accelerate the liberation of values, the decentralization of power, the global spread of wealth. It will also help phase out age-old competitiveness, acquisitiveness and monopolism, which aeons of poverty have perpetuated.

In time, the new abundance will serve to ease out marriage, private parenthood and all other exclusive relationships. Family, children, profession, nationality—all that will have zero meaning. The very concept of a rooted permanent city will be archaic. New York, Paris, Moscow and the rest will be nothing more than museums, as instant modular communities spring up all over the planet. We will flow in and out of linkups, mobilias, jobs, communities, continents. We will be fluid and transplanetary.

Mach 10 hypersonic aircraft using nonpolluting hydrogen fuel will zip people and goods across the planet in an hour. Individual rocketbelts will enable people to free-fly at will. This will give unprecedented autonomy to the individual. Free-fly will totally revolutionize architecture, community planning, transportation and social structures.

New generations of globally telelinked megacomputers will help modify rampages of nature, continuously monitor resources and needs, coordinate the cybernated economies of the world, and operate daily services of communities.

By the year 2000, people will work no more than two or three days a week, seven or eight months a year. In 30 or 40 years we will have evolved to a true 24-hour day; 21st-century telecommunities will be as alive at night as during the day. By 2025 solar satellities may even cancel out day/night cycles, with each community regulating its own desired light inflow.

By the turn of the century, capitalism, socialism and all other philosophies of right and left will be on their way out. The new philosophical thrust will be *Up*: a triumphant new consciousness—a new optimism free of guilt, shame and self-denial. *Up*-wingers will be resigned to nothing. They will consider no goals unattainable.

To be sure, problems will still abound. But they will be problems at a higher orbit of history. Most survival problems—wars, famines, destitution—will be out. We will enjoy more social and biological freedoms, more leisure, more fun, more abundance, more peace of mind, more hope than humans have ever known.

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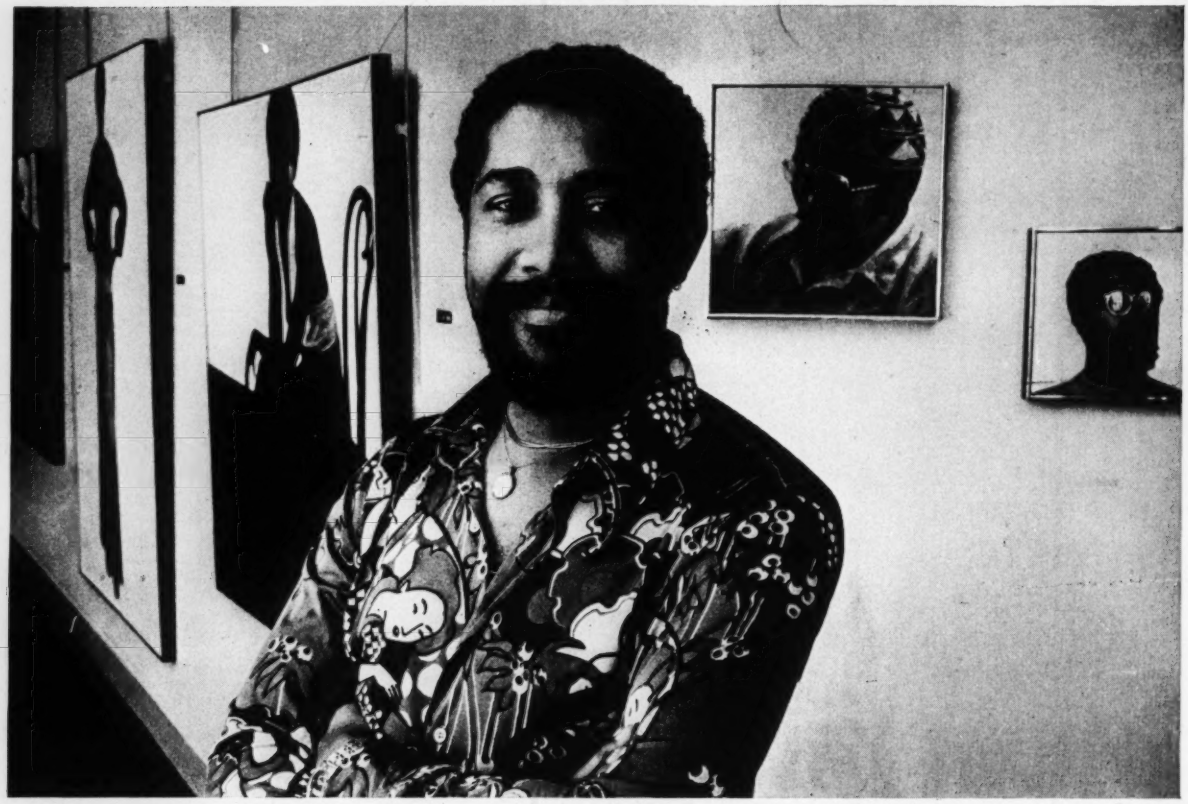

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HOBBIES: Music, basketball, traveling.

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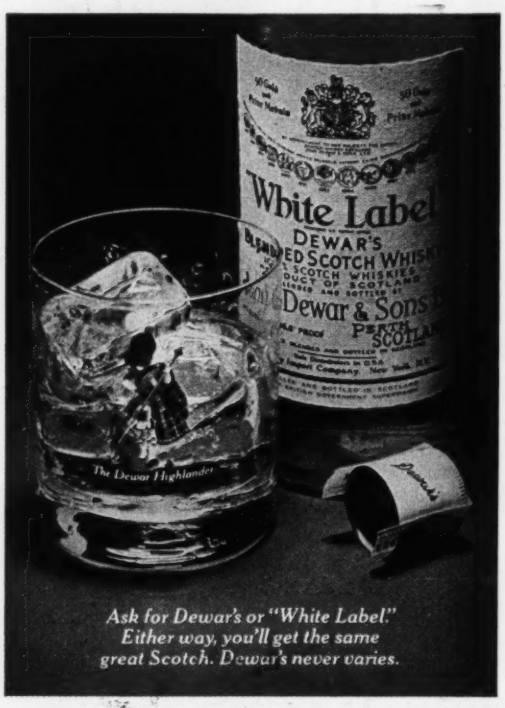
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